

The Iron Age

A Review of the Hardware, Iron and Metal Trades.

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The Ramsay Steam Winch.

The accompanying engraving represents a patent steam winch owned and built by Messrs. H. A. Ramsay & Co., Vulcan Iron Works, Baltimore, Md., which they claim possesses many useful features. It is especially designed for use on board ship for discharging cargo, working the windlass, pumps, &c., but it has been satisfactorily employed for a number of purposes other than that for which it was designed. The machine has two cylinders bolted to the angular side frames, passages being formed through the frames, with the slide jackets inside. This arrangement has been adopted to obtain a rather longer connecting rod than usual, and great stiffness with moderate weight. The cylinders are fitted with metallic pistons, steel piston rods and malleable cross-heads, each fitted with a gun-metal gland nut to take up the wear, and working on a round steel guide-rod. The connecting rods are of wrought iron, fitted with gun-metal bearings at the lower ends. The disk plates are cast solid opposite to the crank pin, to balance the pistons and connecting rods. The engine shaft carries the first and second motion pinions, which are flanged on both sides and made fast or loose by clutches sliding on steel feathers let into the shaft. The second motion shaft carries a third pinion like those described above, and a wheel keyed fast to it. This shaft is also fitted with handles to work the winch by hand when desired. The barrel shaft is turned throughout, and the barrel is keyed to it. The large spur wheel is keyed on the end of the barrel, which relieves the shaft of tension, and a turned brake ring is fitted as shown in the cut. The brake strap is lined with hard wood, and is fitted so as to take up the wear and with lever to hold the load suspended when required.

The barrel shaft projects beyond the frames sufficiently to take a capstan end and chain wheel on one side, and a pulley or whip drum on the other side. The barrel is made long enough to take any reasonable quantity of chain without overlapping; and being directly in front, the chain can be led away and travel on the land without fouling. Messrs. Ramsay & Co. also make this machine without the link motion, but provision is made for running the motion of the barrel by means of the gear. Supposing the engine to be running in one direction the "winch" will lift in the single purchase, and when the double is thrown into gear it will lower slowly, which is of great importance when loading or discharging "wet goods" or valuable packages. For bales or ordinary cargo the brake may be used.

The winch is fitted with hand levers to each pinion, steam connection pipe, cock and lever, pet and grease cocks to the cylinders, and the exhaust may be led in any desired direction. This winch can be fitted with two brass barrel pumps. For this purpose the second motion shaft is forged with a double crank in it, and the bed-plate is cast with channels to receive the barrels and valves. The pumps can be arranged to pump from the bilge fore and aft, or from the sea. They are therefore available for use as powerful fire engines, and can be worked by hand or steam, as well as for washing decks, &c.

This winch can be arranged on a truck with the boiler, &c., complete, so as to render the whole apparatus portable. This arrangement is particularly applicable for traversing a wharf on a railroad track, and to these portable machines is attached a boom crane or derrick if desired. The owners claim that it is one of the best and cheapest steam winches ever introduced.

The Clayton Air Governor.

We show in the accompanying illustration a governor for air compression, manufactured under patents issued by the Clayton Steam Pump Works, 11 to 16 Water street, Brooklyn, N. Y. The invention consists of a piston working inside an air cylinder and connected by a lever to a balance valve. The lever is weighted to any desired pressure, and operates to turn off the steam from the steam cylinder when the air pressure rises too high and turn on more steam when the air pressure goes down. So perfect is this governor that the same pressure can be maintained all day without moving the throttle valve of the engine, it making no difference whether steam is high or low. This air governor is designed for use on the Clayton air compressor, but is adapted for other compressors. It is made in sizes to suit different pressures, and is also adapted to the blowing engines of blast furnaces and steel works, where a steady pressure is desirable.

The manufacturers claim for this governor an important advantage in the economy of fuel attending its use and the greater amount of work which can be done when the pressure is uniform. When no air is used the air piston closes the governor valve, thus preventing waste of steam. It seems to be a very simple and practical device.

It has recently been decided in a Pennsylvania court that an architect cannot obtain a mechanic's lien on a building as security for professional services in preparing plans and specification, although he may do so for such a portion of his services as properly falls under the head of building superintendent in examining materials and

supervising the actual work of construction.

American Exports to Europe.

Mr. John Wilson, United States Consul at Brussels, contributes in a recent report to the State Department a document on the export question which we consider of sufficient importance to print entire.

SIR: I observe in the published extracts from the reports of consular officers on the modes of extending our export trade, a great uniformity in recommending the establishment of sample depots for the exhibition of American merchandise. While I am also of the opinion that this would be the most efficient mode of extending the sale of many of our products in foreign markets, I would respectfully suggest that, if at-

tempted, its success will greatly depend upon the good judgment with which it is organized. As already stated in a former communication to the department, our staple articles of produce require but little effort to place them on the markets of the world; but for the successful introduction to these markets of many of the products of our soil and mechanical skill, embracing articles of diet, labor-saving machines for the manu-

facture of textile, metallic and other materials, as well as the manufactures of the same, with the great number of small articles of practical utility which the genius of our people, aided by our abundant resources and cheap labor, has enabled us to produce, special and well-directed associated effort under the most favorable circumstances will be necessary.

To secure for these products an extended foreign sale it will not be sufficient for our manufacturers and exporters of any of this class of articles to issue their circulars and price lists and send them abroad to consular officers with the request that they present them to dealers for their consideration, nor will it be sufficient, as a rule, to send their agents abroad on flying trips to secure orders. There is an undoubted prejudice throughout this Continent against innovation, and especially American innovation, which is a more potent obstacle to the introduction of our merchandise than either our tariff or unsettled money market, and this prejudice can only be removed

by practical and oft-repeated demonstration of the superiority of our wares, to accomplish which intelligent agents employed by exporters of assimilated merchandise, and deriving a least a portion of their pay from commissions on the sales they make, I am strongly inclined to believe would prove the most practicable and successful. In every great seaport and commercial city of the Continent there are responsible and willing parties to act as agents of American exporters of flour, bacon, lard, petroleum and breadstuffs, in connection with their other commission business, but for the sale of our new industrial products such parties will not do, nor are there many of these products that would justify the employment of special agents for the sale of any one of them, but under an associated agency, strictly American, there can be no doubt an aggregate

and nutritious dishes that are made from this vegetable in the United States are substantially unknown in Europe, and yet with a well-directed educational effort I have not the least doubt that the canned tomato would soon play as important a role on the tables of Europe as in America. It is an admitted fact by all intelligent travelers that in variety and quality the fruits and vegetables of the United States are unequalled anywhere, and it is a philosophical fact that anywhere within similar latitudes the gastronomic tastes of men are not national, but the result of education either forced or otherwise induced, consequently we only want to educate the people of Europe to the appreciation of our fruits and vegetables, both raw and prepared, to secure to ourselves a large and profitable trade in these articles. Neither the soil nor

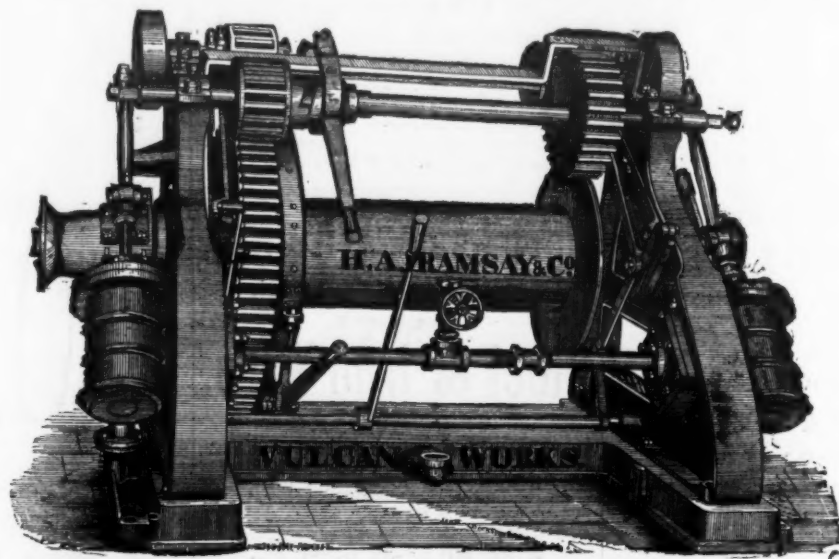
the truth of my previous remark, that prejudice is a more serious obstacle to the introduction of many of our products than tariffs or unsettled prices. It is but a few years since the use of this oil was repudiated in private houses here excepting among the very poor, but at present it is used for lighting purposes in vast numbers of the same classes of families that formerly excluded it from their dwellings. So it is with many of our mechanical products, which, though of undoubted superior merit, have a quality or character of novelty about them that invariably encounters traditional prejudice; but if an active, intelligent agent could demonstrate to these people that one of our perfected stoves or cooking ranges would roast a turkey or cook any other article of diet quicker and better and with greater economy of fuel than their traditional cooking grates, he would soon find a ready sale for his American stoves; or if he could induce some of these carriage makers to build their carriages with our strong hickory-bent felloes and demonstrate their superior character (which he well might do), it would not be long until the clumsy and ponderous carriage wheels now used in this country would disappear and the light, strong and graceful American wheel would be seen in every city. I mention these cases merely to illustrate what might be done in the way of introducing American products generally into these markets by the right kind of effort, but for the introduction of many of them, however intrinsically meritorious they may be, persistent and concentrated efforts will be necessary, and no commission-house organizer for the sale of European manufactures can or will make this effort.

It has been suggested that consular officers ought to be made more essentially commercial agents, by requiring them to receive sample goods of American exports and act as agents in placing them properly before the people of their districts. I do not believe, however, that this would be a good plan. Consular officers, to be useful to their commercial countrymen, ought not only to be uninterested in the merchandise they recommend, but above the suspicion of pecuniary interest in trade transactions. If they were allowed or required to become the representatives of any class of exporters, it would be most difficult to avoid this suspicion on the part probably of both buyer and seller, and thus bring discredit upon the commissions they hold and defeat the object of their appointments. But recognized resident agents of associated American exporters, deriving their pay from commissions on sales they would make, and confined exclusively to the recommendation of the goods consigned to them, would not encounter these suspicions, and by devoting both their time and energy to their business, could accomplish much in extending our export trade. The large manufacturers of well-known American products may afford to trust the sale of their goods to established commission houses here, but special agencies will be found absolutely necessary for the great mass of our smaller and less-known products which now seek a foreign market, and I feel thoroughly convinced that if bazaars or general depots were judiciously established on this Continent upon the plan above indicated, good results would be realized and a large increase of our export trade secured. No great difficulty need necessarily be experienced in establishing general depots for goods of an assimilated character. Agricultural and horticultural implements, stoves, lamps, hardware, furniture, woodenware and articles of general household use might well be associated with canned and preserved meats, fruits and vegetables, so as to furnish a large variety from which, with proper energy, an agent might make profitable sales without risk of loss or damage from contact or other deteriorating influences. There is now in Holland, near the Hague, a bazaar organized by an enterprising company many years since, chiefly for the sale of fancy household furniture and articles of art from all countries, which has proved a complete success, and there can be no good reason why a similar institution for the storage and sale of American articles of daily consumption and indispensable use should not prove a success.

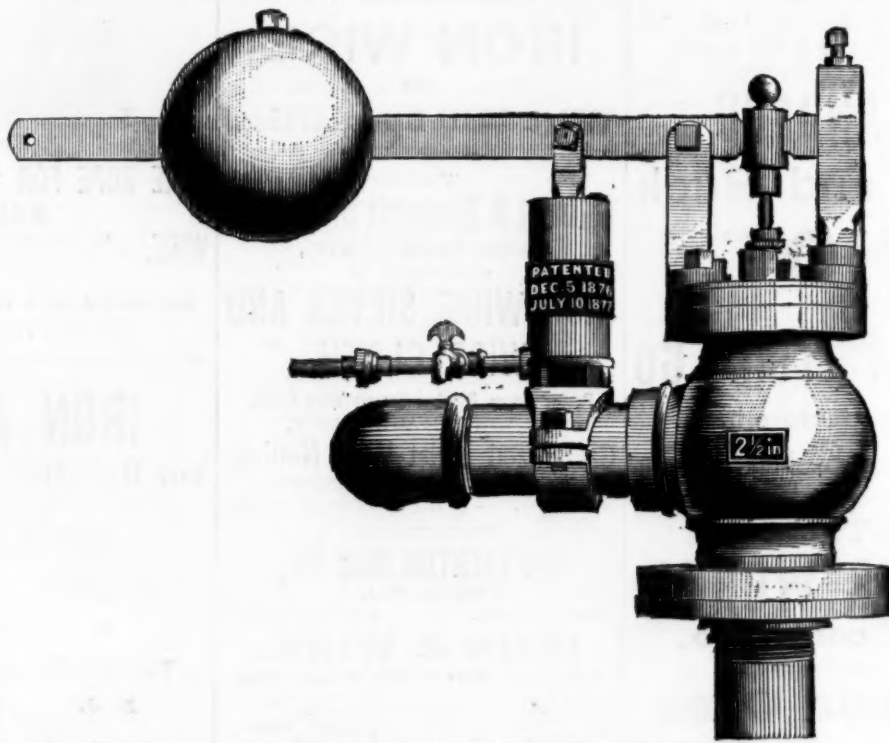
Upon this subject I wish finally to remark that, for all such articles of American produce as can be profitably sold in the markets of Europe, I feel strongly convinced that the associated plan, with resident agents for their sale, will prove the only successful one for the rapid realization of the object desired. Consular officers whose character and position entitle them to the public confidence of their districts can by their influence, exerted indirectly, greatly aid such agents, but to be efficient in this they must be above the suspicion of any pecuniary interest in the objects of their recommendation. From my own experience in the receipt of letters and price lists from exporters, and offers I have received of remuneration for services if rendered, I fear that to make them in any other sense commercial agents would only tend to corrupt the service and defeat the chief object of their appointment.

Very respectfully, &c., JNO. WILSON.

The 100 by 36 feet pottery, built by Geo. Forbes' heirs at Brookfield, Mass., is now running well, with James Smith, a successful potter of West Sterling, as lessee. Five men are now working on fancy vases, pots of various sorts, dishes and saucers. This industry was started in the town's early history,



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SEE PAGE 9.**Phelps, Dodge & Co.,**

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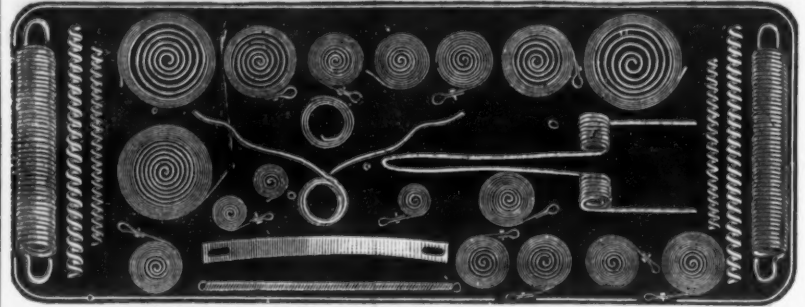
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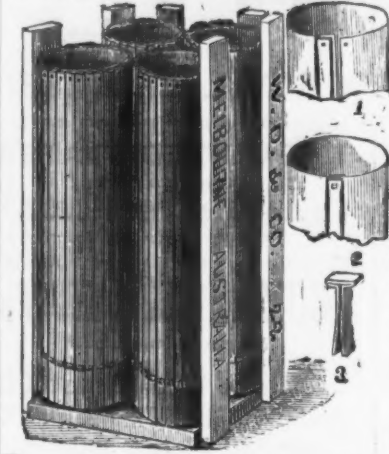


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Adjustable Bottom Metallic Flour and Meal Sieves.



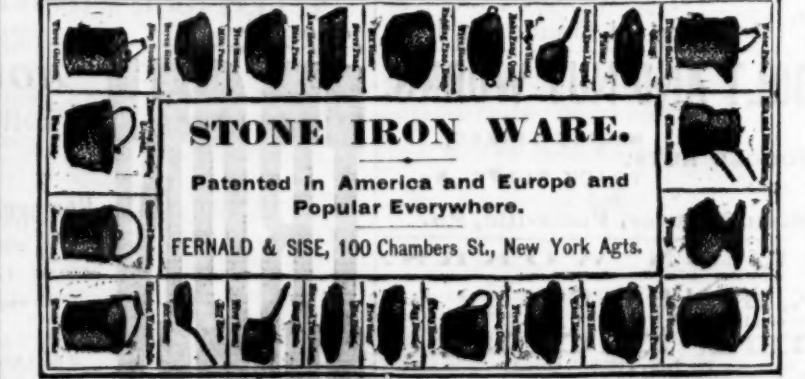
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Tin and Sheet Iron Workers' Tools and Machines.
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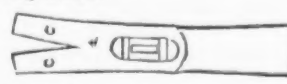
THE METAL STAMPING & ENAMELING CO., 708, 710 & 712 Second St., ST. LOUIS, MO.

New Patents.

We take the following abstract of new patents, recently issued, from the official record:

HAMMER.

To H. Hammond, Hartford, Conn.—June 11.—The holding edges of the claw are provided with serrations for taking hold of nails the heads of which have been broken off, and holding them securely while they are being drawn.



The claw C, provided with serrations.

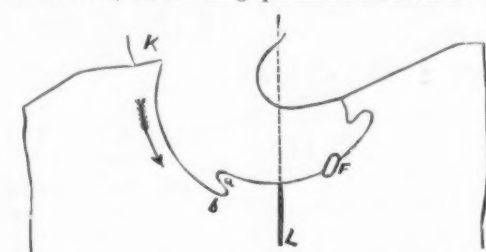
PAPER CHAIR SEATS AND BACKS.

To Nahum Harwood, Leominster, Mass.—June 11.—My improved method, substantially as described, of preparing pasteboard or leather-board, such consisting in coloring it by a bath, and subsequently running it between rollers to even the color and express the surplus liquid, and afterward dipping it in a bath of gelatine and pebbled or embossing it, and treating it with shellac or varnish.

2. As a new or improved manufacture, pasteboard or leather-board evenly colored, coated with gelatine, pebbled or embossed, and shellaced or varnished.

SAW-TEETH.

To Calvin Adams, Russellburg, Pa.—June 11.—The saw-plate has a slot formed in the rim, and extending into a chamber for the reception of the tooth, for stiffening



the plate and obviating excessive hammering in its manufacture, and for keeping the rim from becoming untrue when heated. The tooth has a heel overlapping the edge of the saw-plate, forming a strong bearing for the tooth, and acting as a lever to contract the rim of the tooth. The tooth is secured by a V-shaped edge in the plate, fitting in a corresponding groove in the tooth, and is locked in position by a key driven into notches formed in the tooth and plate.

1. The combination of saw-plate A, having a chamber B, and slot L, extending inwardly therefrom, with a tooth having a projection adapted to engage with said saw-plate and clamp the same on said tooth when in operation.

2. A circular saw-plate having the chamber B and the slot L, as described, in combination with a tooth having the heel K, said tooth being held within the chamber by the V-shaped edge d in said chamber and corresponding groove in the tooth, and locked in position by the wedge F.

SAD-IRON POLISHER.

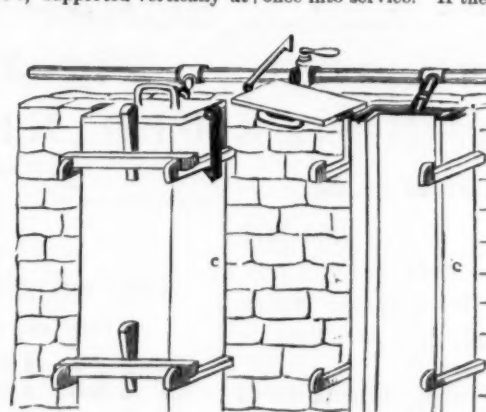
To Emilie G. Rowe, New York, N. Y.—June 11.—The improvement in that class of sad-iron polishers having a polished sur-

face of gritty material, which consists in coating said gritty material with an emollient substance, and covering the same with a porous fabric.

2. As a new article of manufacture, a sad or flat iron polisher consisting of a base, A, gritty material, a, emollient substance, b, and a porous covering, d.

INGOT-MOLD.

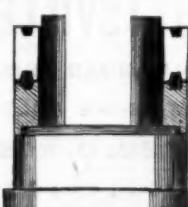
To Benj. T. Babbitt, New York, N. Y.—June 11.—In an ingot-mold, the combination of the fixed part c, supported vertically at



its back, and having a branch air exhaust pipe attached thereto, with the movable part e, and with the brackets, cross-bars, and wedges.

FIRE-PROOF COLUMNS.

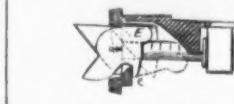
To Peter B. Wight, Chicago, Ill.—June 11.—Upright iron columns are surrounded and protected by incombustible and non-conducting blocks of brick, terra-cotta, or similar substance. The blocks are grooved on their top and bottom edges, and secured in place by hoops of band-iron, covered and protected in the grooves.



In combination with iron columns, incombustible and non-conducting blocks, grooved on their top and bottom edges, and secured in place by hoops of band-iron, covered and protected in the grooves or joints of the same.

LATCH.
To F. W. Brockstieffer, New Haven, Conn.—June 13.—The cam on the latch-case operates the cam on the latch when the latter is operated by the lever.

In a latch, the lever pivoted to the edge of the latch-bolt, one arm of which extends outward and forward of the bevel of the



latch-bolt, a second arm inward, and so as to take a bearing or fulcrum on the inner surface of the face-plate or within the case, and combined with the incline E within the case.

Second St. Louis Fair.—The second exposition of industries in connection with the St. Louis Fair Association opened at the fair grounds Sept. 10 under the most favorable auspices. The exhibition in general and in all its separate features far exceeds that of last year, and does great credit to the merchants and manufacturers of St. Louis and other cities who display their goods and wares. The departments are still incomplete, but notwithstanding this the view on the day of opening was very fine. The art gallery alone has over half a million dollars' worth of pictures and statuary in it, and embraces many of the best examples of the very first American and foreign artists. There is not a poor picture in the entire collection. The machinery and mechanical departments are overflowing with the best pro-

ducts of the shop and factory, and the agricultural implements' exhibit is simply immense. The exercises opened with a national salute fired by a National Guard battery, which was followed by what was called a cavalry tournament in the arena of the amphitheater by members of a National Guard cavalry company and several gentlemen from abroad. This consisted of various saber cuts against dummy cavalry and infantrymen, and the taking off suspended rings by tierce and carte point thrusts with the saber. The prize, a fully equipped cavalry horse, was taken by Lieutenant Canfield of the cavalry company. The military displays will continue the entire week, and will be participated in by home companies and several from Chicago, Memphis, Nashville, Indianapolis, Springfield, Illinois, and other places.

Patents have recently been taken out for a new style of steam fire engine especially adapted to small towns, where power can be profitably used for driving a grist mill, or saw and sash mill. The machine is without ornaments; it has all the essentials of the best steam fire engines, and is so arranged that when run into the engine-house it can be blocked up, the weight taken off the springs, the pump disconnected, and by a band on the fly-wheel it can be made to run a set of stones, a planer, or other mills, according to the size of the engine. If an alarm of fire is sounded in the day time, the belt can be thrown off, the blocks knocked out and pump connected in less time than it takes to tell it, and the engine, with fire burning and steam up, is ready upon arriving at the scene of conflagration to go at once into service. If the alarm be at night,

the engine is ready to run out, for the fires were "banked" when the miller quit work, the belt thrown off, the boiler filled, and every cause of delay removed. The engine being in daily use, is always kept in order and ready for service. The stoppage of the mill while the engine is at the fire can occasion but little unusual inconvenience, for in such towns, in case of fire, everybody, even the miller, leaves his work and turns out to assist his unfortunate neighbors.

American agricultural machinery in



France has captured eight out of the eleven prizes offered by the agricultural Society for exceptional merit, while the United States agricultural display in the Exhibition has been awarded a diploma of honor, and the U. S. educational exhibit a gold medal.

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Special Irons for Bridge and
Architectural Work.

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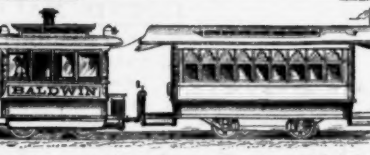
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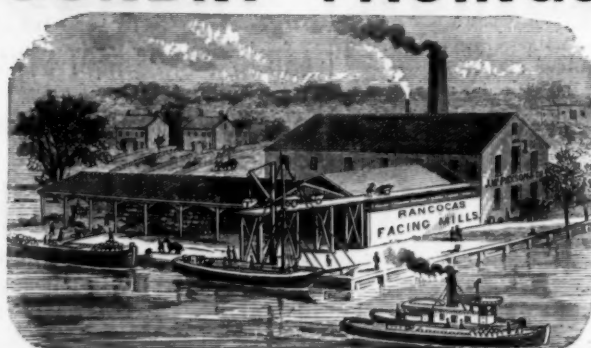
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Of all kinds

FOR CARS, LOCOMOTIVES AND ENGINES,
Including Drawbars, Axles (either hammered or
rolled), Driving Axles, Locomotive Frames, Steamboat
Shafts, Cranks, Propeller Frames, Oil Tool Forgings
&c. &c.

The U. S. Iron & Tin Plate Co.

OFFICE: 112 Smithfield St., Pittsburgh, Pa.
WORKS at Demmler Station
B. & O. R. R., Pgh., Div.

MANUFACTURERS OF THE

Home Made

U. S. CHARCOAL TERNE PLATES,

Stamping Iron, Show Card Iron,
Taggers, Bessemer Steel Plates and
Shovel Iron.

Stove Pipe Iron cut to size.

Special sizes of Pickled and Cold Rolled Iron
made to order.

Send for specification and price list.

The Iron-Masters'
LABORATORY.

Exclusively for the

Analysis of Ores of Iron, Pig and Manu-
factured Iron, Steels, Limestone, Clays,
Slags and Coal for Practical
Metallurgical Purposes.

No. 339 Walnut St., Philadelphia.

J. BLODGET BRITTON.

This laboratory was established in 1866, at the in-
stance of a number of practical Iron Masters, ex-
pressly to afford prompt and reliable information
upon the chemical composition of the substances
above mentioned, for smelting and refining pur-
poses. The object being to make it at once a con-
venient, practically useful, and comparatively in-
expensive adjunct to the Furnace, Forge and Rolling
Mill.

CHARGES TO IRON WORKS.

For determining the per cent. of Pure Iron in
an ordinary Ore..... \$4.00
For the per cent. of Pure Iron, Sulphur and
Phosphorus in do..... 12.50
For each additional constituent of usual oc-
currence..... 1.50
For those of unusual occurrence or difficult
to determine, the charge must necessarily
depend upon circumstances.
For determining the per cent. of Sulphur or
Phosphorus in Iron or Steel..... 7.00
For each additional constituent of usual oc-
currence..... 5.00
For the per cent. of Carbonate of Lime, and
insoluble Silicious Matter in a Limestone..... 10.00
or each additional constituent..... 2.00
or the per cent. of Water, Volatile Combust-
ible Matter, fixed Carbon, and Ash in Coal..... 12.50
For determining the constituents of a Clay, Slag,
Coke, or of an Ash in Coal the charges will cor-
respond with those for the constituents of an ore.
For a written opinion or letter of instruction the
charge must necessarily depend upon circum-
stances.
Printed instructions for obtaining proper average
samples for analysis furnished upon application.

BOSTON ROLLING MILLS

Extra quality small Rods, from best selected Scrap Iron.

SWEDISH AND NORWAY SHAPES,

Nail and Wire Rods. Also,
Horse Shoe Iron, Hand Made

Horse Shoes & the Boston

Horse Shoe.

BOSTON ROLLING MILLS, W. B. ELLIS, Treas.

Office, 17 Battery March St., Boston.

BRADLEY, REIS & CO.,

NEW CASTLE, PA.,

Manufacturers of every description of

PLATE & SHEET IRON

OFFICE, at Works.

Bonnell, Botsford & Co.,

Iron, Nails & Spikes.

YOUNGSTOWN, OHIO.

Spooner & Collins,

COMMISSION AGENTS,

PIG IRON

Blooms, Bar, Sheet & Hoop Iron.

217 N. Third St., St. Louis.

BORAX.

Concentrated Borax in sacks.

Selected concentrated Borax in barrels.

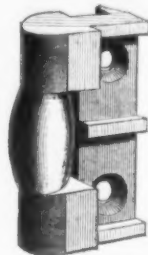
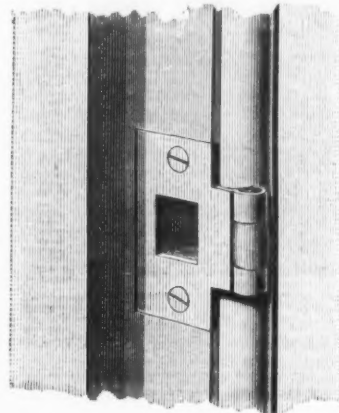
Refined Borax in cases.

Pulverized Borax in barrels.

Pulverized Borax in pound and half pound packages.

Being Sole Agents for Messrs. Smith Bros. Owners of
THE MIXES, we are enabled to sell at the lowest prices.WM. T. COLEMAN & CO.,
NEW YORK, 185 Pearl Street.
SAN FRANCISCO, CAL., Cor. California and Front Sts.

The Yale Roller Strike.

The accompanying illustrations represent
the Yale Anti-friction Roller Strike. Latch
bolts in time generally get stiff and work
with difficulty, and considerable force be-
comes necessary to force the latch back and
close the door. This is not only detrimental
to the door and lock, but it causes annoy-
ance from the noise. The roller-strike at-tachment is intended to obviate this by
diminishing the friction. It consists of a
small plate furnished with a roller, against
which the bolt strikes and is gently pushed
back, greatly reducing both the noise and
the friction. The roller strike is arranged
so that it is easily attached to the door by
taking off the ordinary strike, slipping the
roller attachment beneath its lip and screw-
ing the strike back in place. Our secondillustration shows the position the roller oc-
cupies when in place upon the door. It
will be seen that it does not occupy no-
ticeably more space than the lip of the ordi-
nary strike. The Yale Lock Mfg. Co., 53
Chambers street, New York, are the manu-
facturers, and are making them in bronze
to match fronts of bronze locks or in brass
for ordinary work.

Recent Consular Reports.

Mr. J. E. Montgomery, our consul at
Geneva, in a report dated July 10, says:

I am constantly receiving letters from
parties in the United States upon the subject
of introducing various goods, wares, pro-
ducts and manufactures of every description
into this country for the purpose of extend-
ing and enlarging the sphere of our trade
with Europe. I desire to observe that the
surest, most effectual and perhaps the only
plan by which a market can be established
in this country for American products is that
manufacturers, producers, inventors and all
others interested should forward samples of
their respective goods to some responsible
firms in this city, and at the same time fur-
nish an explicit statement of the actual
price at which said goods can be imported
here by wholesale dealers. I am confident
that good results can be obtained by the
adoption of this method. The Swiss are a
very cautious people and will not commit
themselves to any obligation or contract
without knowing precisely the terms upon
which they are called upon to act. Any ar-
ticle of usefulness, comfort or luxury would
doubtless find a good market in this country
if the cost of importation should be such as
to justify or induce a general demand.

Mr. Fairchild, at Liverpool, under date of
July 12, says:

I have received from the Superintendent
of Emigration the following returns showing
the number of steerage passengers cleared
from this port during the six months ending
June 30, 1878, as compared with the cor-
responding period of 1877:

Year.	No. of Ships.	No. of Pas- sengers.	Nationalities.				
			English.	Scottish.	Irish.	Foreign- ers.	Not stated.
1878.....	401	12,177	14,318	250	4,263	12,443	903
1877.....	350	26,555	14,504	240	2,600	8,216	895
Inc., 1878.	51	5,622	286	10	1,663	4,227	8
Dec., 1878.							

Also the following return showing the
number of arrivals at this port of such pas-
sengers during same period:

Year.	No. of Ships.	No. of Passengers.	
		British and Irish.	Foreign- ers.
1878.....	220	10,765	7,542
1877.....	210	13,262	5,924
Increase, 1878.	10		1,618
Decrease, 1878.		2,497	

The published returns show that during
the month of June, 1878, 71 ships left Liver-
pool with 7315 emigrants for various destina-
tions abroad. These proceeded—to the
United States, 5701; to British North Amer-
ica, 1271; to Australia, 74; to South Amer-
ica, 81; to the East Indies, 46; to the West
Indies, 10; and to the West Coast of Africa,
42. The English emigrants numbered 3033,
and of these 2334 went to the United States,
627 to British North America, 23 to Aus-
tralia and 49 to South America. Of Scot-
tish nationality there were 76, and they pro-
ceeded—53 to the United States, 7 to British
North America, 5 to Australia and 11 to
South America. The Irish emigrants num-
bered 797, and their destinations were:

United States, 728; British North America,
9; Australia, 45, and South America, 15.
Of foreigners there were 3298; 2676 went
to the United States, 615 to British North
America, 1 to Australia and 6 to South

America. The nationalities of 111 are not
given.Mr. Sikes, at Cardiff, replies to a circular
from the State Department of April 11th, as
follows:

The wages paid to farm hands in Wales
vary considerably in different countries. In
those sections which, like parts of Cardigan-
shire and Carmarthenshire, are still remote
from railways and the habits and lives of
the people somewhat primitive, the wages
paid and the cost of living are both lower
than in the more progressive parts of the
principality. But it may be roundly stated
that farm hands are paid an average of \$1.50
to \$3.50 per week, with certain privileges
in the way of beer and house room. Fre-
quently such laborers, when married, are
provided with a cottage, and allowed to cul-
tivate their own vegetable garden.

The wages paid to railway and other la-
borers and mechanics in the urban districts,
may be assumed from the following ex-
amples: Brick-makers, \$2.50 to \$7.50 per
week; engine fitters, \$6 to \$10.50 per week;
ship carpenters, \$1.62 per day; ship smiths,
\$1.50 per day; sawyers, \$1.25 per day;
coopers, \$1.72 per day; riggers, \$1.50 per
day; boiler makers, \$1 to \$1.40 per day;
engine drivers, \$1.25 to \$2 per day (with
premiums for merit); engine firemen, \$1 to
\$1.12; laborers, 10 cents per hour, or 66
cents to 90 cents per day; dock laborers, \$1
per day; painters, per hour, 13 to 14 cents;
masons, 16 cents; carpenters, 16 cents;
plumbers, 15 cents; plasterers, 15 cents.

The cost of living to the laboring class in
towns will probably average \$3 to \$5 per
week for a man and wife without children.
There is a fair amount of thrift prevailing
among this class, who are, however, some-
what given to unnecessary expenditures for
jollification, especially those among them
who are not of Welsh blood. Welsh la-
borers are, as a class, thriftier than the English
and Irish, who help largely to make up the
population of the chief towns in this district.
It should be mentioned also—for it is an im-
portant fact—that the wives of laboring
men here fill a more active place in the
bread-winning scheme than women do in
America. Many go off to their work as
regularly as their husbands, every morning.
Among the occupations followed by women
in this district are some which I think wo-
men nowhere else in Britain engage in—
such as letter-carriers (in lieu of postmen),
mussel diggers, oyster peddlers and the like.
Among the "benefit societies," as they are
called (such as the Odd Fellows, Shepherds,
&c.), is one composed exclusively of women,
and peculiar to Wales alone, denominated
the "Friendly Sisters." I should report
the cost of living in Wales as being
somewhat higher now than it was five years
ago were it not for the very potent influ-
ence now exerted thereon by American im-
ports, especially of beef and of canned or
tinned fruits, meats and vegetables. This
influence has not only reduced the cost to
consumers of the articles most imported
—it has had the further effect of leading to
a spirit of competition among tradesmen
which has caused a sweeping reduction in
the price of every possible article of house-
hold use to cash buyers. Of course the
poorer classes, who seldom are able to buy
on credit, profit by this movement among
dealers. Meantime, the rate of wages has
somewhat decreased within the past five
years and the tendency is still downward.
Trade throughout the district is in a very
depressed condition. There is no little dis-
tress among the laboring classes owing to
lack of employment.

Mr. Spencer, at Genoa, replying to the
same circular, says:

The cost of living to the laboring class in
Italy differs materially with the locality,
ranging from 60 centimes to 1 franc per day
in the rural districts, and from 1.25 to 1.75
francs in larger cities. The fare of the
Italian laborer is usually very simple, con-
sisting for the most part of bread, boiled
chestnuts, polenta or mush, and minestrone,
a substantial soup composed of vegetables,
olive oil and macaroni. This, with an oc-
casional bottle of ordinary wine, a relish of
stock-fish or cheese, and at rare intervals,
on great festivals or holidays, a dinner of
fresh meat constitutes the homely fare of the
Italian laborer or peasant. The cost of living
to the laboring classes has fluctuated more or
less during the past five years, but on the
whole has not materially increased.

In relation to the present state or condition
of trade within this consular district, it may be
said that the commercial depression which
has prevailed for several years past contin-
ues with unabated, if not increasing severity.
During the past year there has been a
falling off in Italian commerce of about 17
per cent. Aside from the general causes
which have operated to produce a general
stagnation of business here as elsewhere,
there are some special reasons for this
temporary decline in Italian commerce.
Among these may be enumerated the dimi-
nished production during the past year of
wine, olive oil and almonds, but more es-
pecially the crisis which has overtaken the
silk industry, in which there has been a fall-
ing off of 119,000,000 in the imports
and 234,000,000 in the exports. From the
last monthly statement of the Minister of
the Treasury, it appears that the total
amount of paper currency in circulation
April 30, 1878, throughout the kingdom was
1,537,907,949 lire, and the specie reserve
held by the various banks of issue was
128,698,496 lire. This currency is a legal
tender for all debts, both private and public,
with the exception of custom duties, and at
the present date bears the relation to gold
of 92.4 to 100. [The lire is equal to about
20 cents.—Ed.]

A great meeting of Americans was held
on Sept. 12 at the United States Consulate,
Geneva, in favor of a Franco-American
treaty of commerce. Mr. Montgomery pre-
sided, and Messrs. Young and Clark, mem-
bers of the American Committee, addressed
the meeting. A motion made by Mr. Bates
of New York in favor of the treaty was
unanimously adopted.

A Meriden watchmaker has made a steam
engine weighing only fifteen grains. The
works are of silver, and three drops of water
are enough to keep them in motion twenty
minutes.

THE BEST KITCHEN AND TOILET WARE.

It is made of
Purified Sheet Iron
and Covered with
a Perfect Glaze
of Unquestionable
Purity.



Its Merits have
been tested and are
vouched for by the
Foremost Chemists
and Experts in the
Land.

MANUFACTURED ONLY BY THE
St. Louis Stamping Co., St. Louis, Mo.
PRICE LISTS, DISCOUNTS AND TESTIMONIALS FURNISHED THE TRADE.

Branch Office & Salesroom,

McNEALS & ARCHER,

BURLINGTON, N. J.

Flange Pipes.

General Foundry Work.

CAST IRON PIPES

FOR WATER AND GAS.

Light Castings and Metal Patterns

A SPECIALTY.

TAYLOR & BOGGIS,

Iron Founders,

Nos. 65, 67, 69, 71 & 73 Central Way, CLEVELAND, O.

CORRESPONDENCE SOLICITED.

Will make estimates on completed work when desired.



PATENT
Corrugated Bottom
COAL HODS.
ALSO
PATENT
Oriental Funnel
COAL HODS.

MANUFACTURED BY

F. HABERMAN,

No. 294 Pearl Street, - - NEW YORK.

ALSO MANUFACTURERS OF

TIN WARE.



LIGHTNING HAY KNIVES,

WEYMOUTH'S PATENT.



This knife is the best in use for cutting down hay and straw in mow and stack, cutting fine feed from bale, cutting corn stalks for feed, cutting peat and ditching marches.

The blade is best cast steel, spring temper, easily sharpened, and is giving universal satisfaction. A few moments trial will show its merits, and parties once using it are unwilling to do without it. Its sales are fast increasing for export as well as home trade, and seems destined to take the place of all other Hay Knives.

They are nicely packed in boxes, one dozen each, of 50 lbs. weight, suitable for shipping by land or water to any part of the world.

Manufactured only by

Hiram Holt & Co.,

East Wilton, Franklin Co., Maine.

For sale by the Hardware Trade generally.

SEMPLE & BIRGE MFG. CO., Agents at St. Louis.

"WROUGHT BUTTS."

SEND FOR PRICES TO

The McKinney Mfg. Co., { Works, Allegheny City, Pa.
{ P.O. Address, Pittsburgh, Pa.

Southern Advertisements.

Southern States Coal, Iron & Land Co.

LIMITED,

ENGINEERS, IRON FOUNDERS & BOILER MAKERS,
Coal Miners and Fire Brick Manufacturers.

The Only Makers in the Southern States of

WASHED FOUNDRY COKE,

Free from Slate and Sulphur.

Machine-Made Brick, Limestone, Lumber and Shingles.

FARMS TO LET.

Apply to the HEAD OFFICE, South Pittsburg, Tennessee.

W. A. HOSKINS,

DEALER IN

MINERAL LANDS,

Chattanooga, Tenn.

Offers for sale, at very low figures, some of the most valuable Charcoal and Coke Properties within the district. Full particulars furnished on application.

Vulcan Iron & Nail Works,

Chattanooga, Tenn.,

MANUFACTURERS OF

BAR IRON, NAILS, RAILROAD SPIKES, FISH BARS AND BOLTS BRIDGE
AND CAR BOLTS, AND FORGINGS GENERALLY.

ROANE IRON COMPANY,

Manufacturers of and Dealers in

Pig and Railroad Iron.

CHATTANOOGA, - - - - - TENN.

WASON CAR & FOUNDRY COMPANY,

Chattanooga, Tenn.,

Manufacturers of

RAILWAY FREIGHT CARS, Car Wheels and Castings.

TENN. COAL & RAILROAD COMPANY,

A. M. SHOOK, General Manager, - - - Tracy City, Tenn.

Proprietors of the Sewanee mines, capacity of 50,000 bushels of coal and coke per day. Several important institutions of learning, including the University of the South, also the celebrated Beersheba Springs, are located upon the line of this Railroad.

Being also the proprietors of several extensive tracts of very fine lands, offer special inducements to colonies. Communications addressed to the General Manager will receive prompt attention.

T. J. BROWN,

Rockwood, Tenn.

Miner and Contractor of
Fossiliferous Ores.

A superior article delivered at low figures at any furnace within the district or at any point on the Ohio River. Refer to Roane Iron Co., Chattanooga Iron Co., or S. B. Lowe, Chattanooga.

S. Whinery, Civil Engineer,

CHATTANOOGA, TENN.

Late Division Engineer Cincinnati Southern Railway. Will prepare plans and superintend construction of Bridges, Buildings, Roofs, Roads, Streets, Water Works, Sewers, Canals and other public works. Examinations, location and construction of railway lines a specialty. Surveys, examination and reports made of mineral lands. Business attended to thoroughly and promptly. First-class references given.

S. B. LOWE,

Pig Iron, Storage & Commission.

Dealer in Charcoal and Coke Pig Iron for Foundry, Forge or Car Wheel purposes.

Chattanooga, Tenn.

GEORGE W. BRUCE,

No. 1 Platt St., New York,

Agent for CLEMENT & MAYNARD,
Great Inducements offered in their Superior Shovels, Spades and Scoops and Trowels, as well as Hoes. A large stock on hand.

CHAMPION BARROWS.



WITH WOOD OR IRON WHEELS.
A first-class article and a specialty, that will make a demand in any market and afford a good margin for dealers. We are prepared to furnish them in large quantities. Manufactured by

BRYAN MANUFACTURING CO., Bryan, O.

SEMPLE & BIRGE MFG. CO., Sole Western Agents, ST. LOUIS, MO.

For Sale by THE NEW YORK FLOW CO., General Eastern Agents, 55 Beekman St., New York.

STANDARD NUT CO.,

Pittsburgh, Pa.,

MANUFACTURERS OF

HOT PRESSED

Square & Hexagon Nuts,

R. R. FISH BARS,

BOLTS.

SPIKES,

RIVETS, &c.

IRON AND STEEL DROP FORCINGS

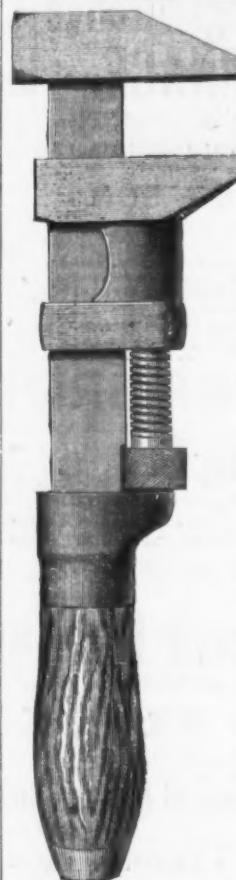
All shapes, small and large, including
Gun, Pistol, Wrench Bars, &c. Also, Die Sinking. Manufacturers also of
Bricklayers', Moulders' and Plasterers' Tools, Saddlers'
Round and Head Knives.

WILLIAM ROSE & BROS.,

36th & Filbert Sts., West Philadelphia.

STANDARD GIRARD WRENCH.

WARRANTED.



FOR
STRENGTH
AND
Durability
IT HAS
NO SUPERIOR.

GUARANTEED
IN
EVERY RESPECT.

Wrought Bar, Head
and Screw.

Owing to the in-
creased demand
for these justly

Popular Wrenches,
we are now manu-
facturing more than
any other establish-
ment in the world.

Our Wrench hav-
ing been imitated by
other manufactur-
ers, we have adopt-
ed the above Trade
Mark, and will here-
after stamp all our
goods.

SEND FOR
TERMS AND PRICES.

GIRARD WRENCH MFG. CO., Girard, Pa.

PATENT CONVEX

Fluting & Smoothing Iron.

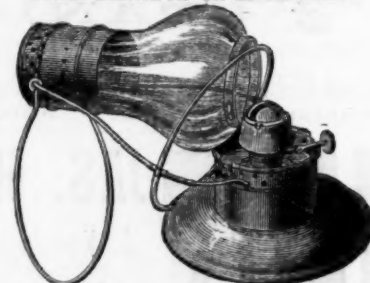


1st. It can be used as an ordinary Smoothing Iron.
2d. It is a Fluting Machine as well as a Smoothing
Iron. 3d. The Fluting Attachment being made of
brass, and convex in form, it has all the advantages
of the crank machine. 4th. It combines the two
articles in one, taking up the room of but one ma-
chine, and is always ready for use.

A. A. WEEKS, Manufacturer,

No. 82 John Street, New York.

Patent Lantern for Oil and Kerosene.



This Lantern is the most salable in the market,
it burns Kerosene or Oil with superiority. The
flame is regulated from the outside. The globe is
removable. It is neat, Cheap, handy, compact
and durable. It has more advantages than higher
priced Lanterns. SEND FOR PRICE-LIST.

N. DUBRUL & CO.,

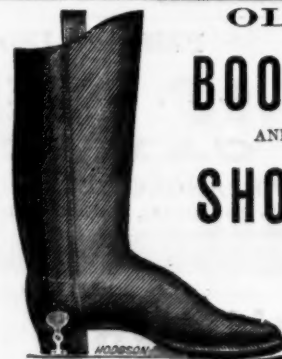
Manufacturers of Lanterns,
441 & 443 Plum St., Cincinnati, O.

OLD

BOOTS

AND

SHOES



Can be Straightened
AND NEW ONES KEPT STRAIGHT
BY USING

LYON'S PATENT
Metallic

HEEL STIFFENER.

Send for a new Illustrated Price List for 1878.

N. LYON, Sole Manufacturer,
ALBANY, N. Y.

Stove Repairs.

Repairs for Stoves made at Troy, Albany, Rochester,
Cleveland, Buffalo, Boston, St. Louis, Quincy, Chicago,
Milwaukee and elsewhere, at
W. C. METZNER,
127 W. Randolph St. CHICAGO, ILL.



USE THE BEST.

NEW



THE NEW AMERICAN FILE COMPANY have the exclusive right to use the Bernot process for cutting Files. By this method all the advantages of hand cutting are secured, together with an accuracy unattainable in hand work. They are the only manufacturers who employ machinery for testing Files and Steel.

NEW AMERICAN FILE CO., Pawtucket, R. I.

AUBURN FILE WORKS,
Superior Hand-Cut
FILES AND RASPS,
MADE FROM IMPORTED STEEL. EVERY FILE WARRANTED.
FULLER BROS., Sole Agents,
89 Chambers and 71 Reade Streets, N. Y.

Granted for



McCAFFREY & BRO.,
Pennsylvania File Works,

Fourth St., north of Columbia Ave., Philadelphia, Pa., U. S.

Superior Goods.



Silver Medal.



Domestic and foreign buyers who are desirous of handling a superior File or Rasp should send us their orders. Gentlemen visiting the Exhibition Universelle in Paris are invited to examine our exhibit at D 3, American Section.

Highest Premium.



Steam and Frost prevented on Show Windows.



REVOLVING VENTILATORS

For everything (and every size), from a hat or cap to an exhibition building. Kitchens, Landries, &c., ventilated without draft. Durable, strong, without rivets or solder. Oiled for six months. Each one has storm cap. Retail price, size six inch diameter, \$1.00 and upwards; apparatus with which any one can cut circles in glass, 15 cents each.

Protective Ventilators avoid drafts, exclude dust, dampness, malaria and germs of disease; adopted by hospitals, schools, institutions, &c.; applied to any window or room.

Prof. A. L. Loomis, M. D., University of City of New York, writes as follows: "From my personal experience and that of my patients who have used your Ventilator during the past six months, I am convinced that your method of removing dust, impurities and dampness from the atmosphere is the best which has as yet been proposed. By it the air in an apartment can be constantly changed without causing drafts. I would especially recommend its adoption in sick rooms, sleeping apartments, nurseries and school rooms."

Air Filters and Moisteners, placed over hot-air registers of furnaces, &c., prevent dust and supply steam filtered air. Prices and discounts to the trade sent on application.

The "Economy" Molding Weather Strip is perfect in every respect. By enlarging edge of rubber or felt, and making slot in molding to correspond (see engraving), we save all after expense of molding. Once purchased it will last a lifetime, because rubber, etc., has only to be removed by taking old piece out of either end of molding, and sliding in a new piece. By this method of securing rubber all uncertainty of fastening or undoing of glue or tacks is overcome.

Rubber supplied with enlarged edge and instructions to enable Car Manufacturers, Carpenters, Builders and far off trade to make slots in Sashes, Doors, Moldings, &c., and thus make perfect Weather Strips.

No. 6.



BRACHER VENTILATOR CO., No. 3 Park Row, New York.



Extension Cylinder Night Latches.

KING'S PATENT, June 26, 1877.

Cylinders adjustable for doors from 1 1/4 inch to 2 inches.

FRANCIS MANY,

143 Chambers St., New York.

"Common Sense"

MOUSE TRAPS,

For Home and Export Trade.

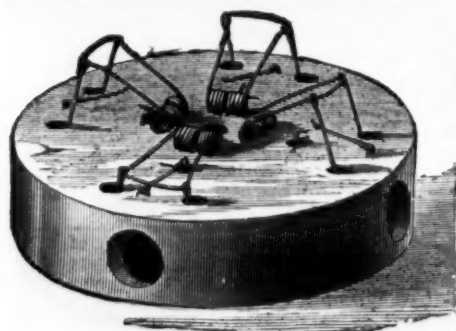
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RIPLEY MFG. CO.

Unionville, Ct., U. S. A.,

Manufacturers of

House Furnishing Hardware.



FILES & RASPS,

Best Cast Steel.

HAND-CUT. Manufactured by

JOHNSON & BRO.

No. 1 Commercial Street, Newark, N. J.

ESTABLISHED 1850.

Chas. Spruce & Co.,

Manufacturers of HAND CUT

FILES AND RASPS.

Every File warranted.

CHALMERS & MURRAY,

Sole Agents, 76 Reade St., New York.

SPENCER & UNDERHILL,

94 Chambers St., N. Y., Agents for

American Screw Co.'s Wood Machine and

Rail Screws, Stove and Tire Bolts, Rivets, &c.

O. Ames & Sons, Shovels, Spades and Scoops.

A. Field & Son, Tacks, Brads, Nails, &c.

G. F. Warner & Co., Carriage Clamps.

We have also on hand a general assortment of Hardware



THE GIANT PAD LOCK.

Manufactured by

THE SMITH & EGGE MFG. CO.

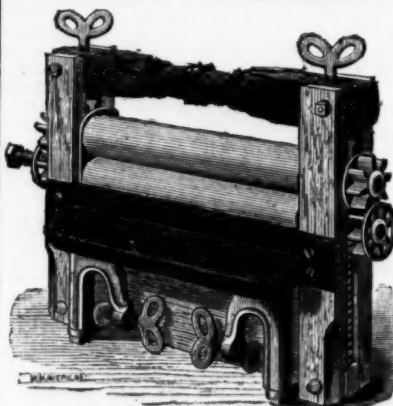
(Centennial Award.)

"Superior in Every Respect."

This is one of the best selling Locks in the market, and affords the dealer a large profit. It is thoroughly and strongly made—of the best material—very handsome in appearance, and every Lock is warranted. Orders solicited. Address as above.

Lock Box 105, Bridgeport, Conn.

Keystone CLOTHES WRINGERS.



Wood Frame Cog-Wheel Wringers.

No.	Size of Rolls.	Price per doz.
10	10x1 1/2	\$60.00
12	10x1 1/2	\$63.00
14	11x1 1/2	\$68.00
16	11x1 1/2	\$71.00

Wood Frame Friction Wringers.

No.	Size of Rolls.	Price per doz.
1 1/2	10x1 1/2	\$51.00
1	10x1 1/2	\$44.00
3	11x1 1/2	\$52.00

Self-Adjusting Iron Frame Friction Wringers.

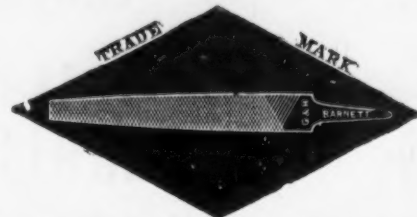
No.	Size of Rolls.	Price per doz.
2 1/2	10x1 1/2	\$1.00
2	10x1 1/2	\$4.00
4	11x1 1/2	\$2.00

EVERY WRINGER WARRANTED.

Special rates given for export. Send for price list of other goods for home and export trade.

F. F. ADAMS & CO.,
Erie, Pa.

Black Diamond File Works.



Awarded by Jurors of Centennial Exposition, 1876, for "VERY SUPERIOR GOODS."

G. & H. BARNETT,

39, 41 & 43 Richmond St., Philadelphia.

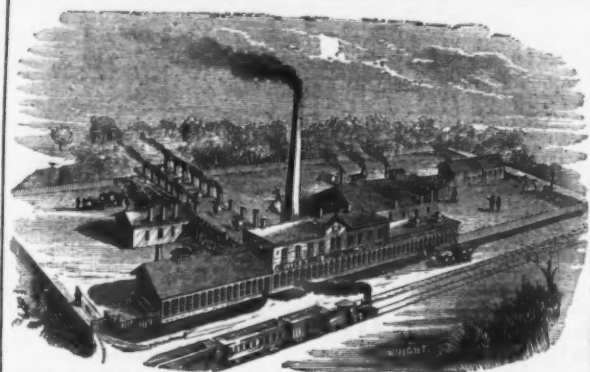
CHARLES B. PAUL,
Manufacturer of HAND CUT FILES.

Warranted CAST STEEL.

187 Tenth Street, Williamsburgh, New York.

All descriptions of Files made to order. Price List mailed on application.

Established 1863.



HELLER & BROS.,
Newark, N. J.,
Manufacturers of Celebrated
American Hand-Cut Horse Rasps
and Files.

For Sale by Iron and Hardware Dealers generally.

AUSABLE HORSE NAILS
POLISHED OR BLUED.
HAMMERED AND FINISHED



The Ausable Nails

Are Hammered Hot,

And the Finishing and Pointing are Done Cold,

Thus Imitating the Process of Making Nails by Hand.

Quality is **Fully Guaranteed.**

For Sale by all Leading Iron and Hardware Houses.

ABRAHAM BUSSING, Secretary,

4 Warren Street, New York.

Philadelphia Screw Co.,

MANUFACTURERS OF

Iron and Brass

WOOD SCREWS

Of Every Description.

OFFICE AND FACTORY,

N. W. Cor. 12th & Buttonwood Streets, Philadelphia, Pa.

Complete assortment at lowest market rates.

The only **GENUINE D. R. BARTON Tools**

ARE MADE BY

THE D. R. BARTON TOOL CO.,

Cor. Mill and Furnace Streets,

ROCHESTER, N. Y.

AGENCIES:

HEATON & DENCKLA, 507 Commerce Street, Philadelphia, Pa.
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NATHAN WEED, 4 Gold Street, New York.

A. FIELD & SONS,

TAUNTON, MASS.,

MANUFACTURERS OF

Copper and Iron Tacks, Tinned Tacks, SUPERIOR SWEDES IRON TACKS

For Upholsterers' Use, Saddlers' Supply Card, Clothing, etc., etc.

American and Swedes Iron Shoe Nails.

Zinc and Steel Shoe Nails, Carpet, Brush and Gimp Tacks, Common and Patent Brads, Finishing Nails, Annealed Trunk

and Clout Nails, Hob and Hungarian Nails, Copper and Iron Boat Nails,

Patent Copper Plated Tacks and Nails,

FINE TWO PENNY & THREE PENNY NAILS,

Channel, Cigar Box and Chair Nails, Leathered Carpet Tacks, Glaziers' Points, etc.

Offices & Factories at Taunton, Mass.

Warehouse at 78 Chambers St., New York,

where may be found a full assortment of Tacks, Brads, &c., for the accommodation of the New York Wholesale and Jobbing Trade.

Any variations from the regular size or shape of the above-named goods made from sample to order.

Hoisting Machinery

MANUFACTURED BY
CRANE BROTHERS MFG. CO.,
Chicago.

The Upright Family Scale

PATENTED.



With Tin Dish.

Weighing 12 lbs.
by 1/4 lb.

List \$16 per
Dozen.

Liberal Discount
to the Trade.

This Scale has an
attachment for
Taking the
Tare. Just the
thing for family use.

Manufactured by
JOHN CHATILLON & SONS,
89, 91 and 93 Cliff St., NEW YORK.

Geo. M. Eddy & Co.,
351 & 353 Classon Ave., Brooklyn, N. Y.
Manufacturers of

MEASURING TAPES.

Of Cotton Linen and Steel.

For all purposes for which Tape Measures are required.

Only manufacturers of

Paine's Patent U. S. Standard Steel

Measuring Tapes,

Pat. Spring Measuring Tapes

of Lino and Steel.

FINE TEMPERED STEEL SPRINGS.

FINE TEMPERED STEEL HAND SAWS.

From 1/4 inch wide upward. Warranted tougher than

any other Hand Saw. Catalogues on application

PRIZE MEDALLISTS:

London, 1862; Oporto, 1865; Dublin, 1865; Paris,
1867; Moscow, 1873; Vienna, 1873. and only
Award and Medal for Self-Coiling Steel
Shutters at Centennial Exhibition,
Philadelphia, 1876.

CLARK & CO.,

ORIGINAL INVENTORS AND SOLE

PATENTEES OF

Noiseless Self-Coiling Revolving

STEEL SHUTTERS,

FIRE AND BURGLAR PROOF.

Also Improved

Rolling Wood Shutters

Of various kinds. Clark's Shutters are the Best
and Cheapest in the world. Are fitted to new
Tribune Building, Lenox Library, Delaware and Hud-
son Canal Co.'s Building, Transatlantic Steamship
Co.'s new Dock, American News Office, &c., Posey
County Court House, Mt. Vernon, Holt County
Court, Oregon, Mo. Also to buildings in Boston,
Cincinnati, Detroit, Janesville, Wis., Baltimore,
Canada, &c. Have been for years in daily use in
every principal city throughout Europe, and are in-
dorsed by the Leading Architects of the
World.

Office and Manufactory,

162 & 164 West 27th Street, N. Y.

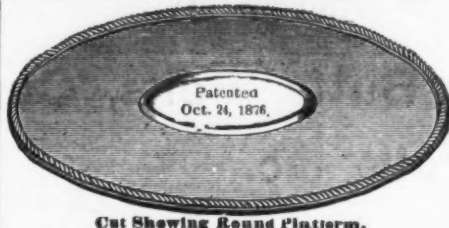
ANSONIA CORRUGATED STOVE PLATFORM

Manufactured by the

Ansonia Brass & Copper Co.

Office, 19 & 21 Cliff Street,

NEW YORK.



Cut Showing Round Platform.

Section Showing Edge.

ANSONIA Bronzed Fire Screen,

With Ornamented Mouldings.

PATENT APPLIED FOR.

The Portable Bronzed Fire Screen or
Shield, as shown in the illustration, is especially
designed for the safety and protection of walls, fur-
niture, woodwork, paper or varnish from heat.
Being constructed of metal, with firm and substan-
tial edges, curved in form to stand alone, it may be
easily adjusted to any position about a stove, before
a grate or fire place. The demand for something
useful, durable and ornamental as a Fire Screen has
long been felt, and having finally accomplished the
desired result, we are prepared to fill all orders
promptly.



CHAINS

UNION CHAIN WORKS,

REITER & MORTON,

Pittsburgh, Pa.,

Manufacture all kinds of

Coil, Cable, Crane, Railroad, Wagon and Agricultural Chains,
From Best Standard Brands of Iron.

Our Chains are all thoroughly tested and warranted, and will be found equal to the
best of either home or foreign make.

Prices the very Lowest.

BROWN & SHARPE MFG. CO

Providence, R. I.,

MANUFACTURERS OF

MACHINERY & TOOLS.

Gears Cut and Index Plates Made and
Drilled to Order.

PATENT CUTTERS FOR THE TEETH

OF
GEAR WHEELS



can be sharpened by grinding without changing their
form. Cutters made on this plan will outlast many of
the old form, with the advantage of being always ready
for use. If the cutter becomes dull before a wheel is completed, it can be taken out, sharpened and
returned to its place in a few moments without risk of altering the form of teeth to be cut. Cutters
for milling any irregular form made to order on the same plan. Parties having occasion to use mills
for irregular shapes on sewing-machine, gun or other work, will readily see the advantage such cutters
possess over those in general use, both as regards economy and convenience. Descriptive circular
with price list sent by mail on application.

RHODE ISLAND HORSE SHOE CO.,

OFFICE, 81 Canal Street, Providence, R. I.

WORKS at Valley Falls, R. I.

Manufacturers of

PERKINS and RHODE ISLAND PATTERNS of

HORSE AND MULE SHOES.

The Famine in Morocco.

Mr. Mathews, American Consul at Tan-
giers, sends the following, dated June 14-
in reference to the famine in Morocco:

From want of rain the Southern part of
Morocco is suffering from famine, every de-
scription of food being exceedingly scarce.
The picture is gloomy in the rest of the em-
pire also, owing to the drought of the season.
Starvation is staring the native tribes of the
interior in the face. Their fields are com-
pletely parched, the crops have entirely
failed, and their distress is great for want of
employment, as they gain their subsistence
chiefly by tilling the ground and gathering
in the crops. These poor Bedouins, who vied
with each other in assisting their brethren of
the Riff Coast last year, are now worse off
than they were. The want of rain, which
would enable them to raise fodder, causes
the holders of cattle to bring them into the
town to be disposed of at any sacrifice, as
the herds and flocks are dying by thou-
sands. Cows are selling for \$1 each and
sheep at 20 cents; the mortality of cattle is
enormous; grain is very scarce, and the little
that is to be seen in the market is very dear,
prices having increased 300 per cent. Rice and
flour are being imported from England and
France, but up to the present in small quan-
tities. It is said, however, that large quan-
tities of flour have already left Marseilles for
this coast. But for the emperor's edict to lay
an import duty of 50 cents on each sack of
foreign flour imported, I feel sure there
would be also direct importations from the
United States.

The crops in Spain will prove very indif-
ferent this year, particularly on the Eastern
coast, where much barley is generally pro-
duced. At Tangier some late showers have
done a little good to the fields, which will
benefit the cattle. The province of Mogador
is in a frightful state of misery. The
Moors get no assistance from the govern-
ment, and little or nothing from their co-
religionists; they are mainly dependent upon
the charity of foreigners. The Jews are
behaving well to their poor brethren. So
much misery and want are really distressing.
The only food upon which the poorer class
subsist in the province of Haha is yernee, a
venomous plant, the root of which is of the
size and form of a nut. To remove the
poison it has to be well washed, boiled and
pounded, then again heated before it is
eaten.

There is no prospect of any alleviation of
this misery until the next harvest, even if
favored by a good season, has been
gathered, and a moment's reflection will
show the many months which must elapse
before that can happen even under the most
favorable circumstances. Even should plen-
tiful rain fall during the coming season the
famine will not be in any way diminished,
as no advantage will be derived therefrom
by the starving population until the harvest
of next year, and, moreover, most of the
poorer peasants will have used up their small
hoards of grain kept back for seed, and the
animals necessary for the plow will have
been carried off by the famine. A commit-
tee of gentlemen interested in Morocco has
lately been formed for the purpose of organ-
izing a relief fund. The total amount of
subscriptions promised at the first meeting
was \$2000. Energetic steps will be taken in
the matter; the general fund will be de-
voted to the relief of the distress existing in
the seaport towns of Morocco, it being the
custom with the starving natives of the in-
terior in times of want to flock to the sea-
ports. A Morocco famine relief fund has
been already organized at Gibraltar. I un-
derstand from the British Minister that his
government will subscribe \$1000, and it is
hoped that the many who have visited
Morocco and met with proofs of the kind-
ness and good will invariably shown by the
natives to foreign travelers, will respond to
the appeal to their feelings of charity.

United States Trade with Central America.

At the office of Don Jacobo Baiz, Consul
General for the republics of Guatemala,
Salvador and Honduras, an *Iron Age* re-
presentative was favored with an interest-
ing conversation respecting trade relations
with those countries. Our attention was
first directed to a series of impressions
from a set of metallic dies made in New
York for the mint just being established in
Honduras, the machinery for which was re-
cently shipped from the works of George C.
Howard, of Philadelphia, and is about start-
ing into operation. The coins are of the
same denominations as those issued by the
United States Mint, and are of the same size
and standard. Their appearance differs
only in minor details. The diplomatic rep-
resentatives of Honduras affirm that their
country is as rich in precious metals as Cali-
fornia, assays made in New York by the
Van Wick Smelting Company yielding \$4700
per ton. Our informant adds, by way of em-
phasis, "This is the actual fact."

The trade of the Central American States,
as we are informed, has a larger volume
than is commonly supposed, from the fact
that exports from the United States are not
credited separately in the commercial state-
ments made up at the custom house, as all
merchandise going via the Isthmus of
Panama becomes agglomerated under the
head of the United States of Colombia and
Central America in general. The aggre-
gate increases from year to year. The
sentiment of the people in all those
republics among "our nearest neighbors"
is favorable to intimate commercial rela-
tions, the disposition being to regard the
United States as the mother republic. The
suggestion is offered by the consular
agents that if manufacturers in this country
would adopt the plan of sending out com-
mercial travelers, the same that is resorted
to at home, trade would be increased ten-
fold, as there is a broad field for the in-
roduction of all kinds of American machinery,
hardware and general merchandise. The
advantage would be obvious, as we are as-
sured, from the fact that at present the
countries here referred to export on an av-
erage about 40 per cent. more than they im-
port, thus giving good guarantees for a safe
and lucrative business. Under the present
state of affairs any difference against us is
settled by remittances of exchange on Eu-

rope, serving to increase the apparent bal-
ance against us on European account.

One reason for the comparatively limited
amount of our exports to the Central Amer-
ican republics is, so we are informed, that
our manufacturers do not take enough pains
to inquire into and consult the peculiar
tastes and special wants of those countries
and make goods suited to the demand.
They do not cater. For instance, dry goods
are wanted. If the merchant goes to Man-
chester he buys a case of prints which con-
tains a full assortment of colors and designs
suited to the tastes of his country, whereas
if he comes to New York to obtain a similar
assortment he can get it only by splitting
up several cases and thus paying a higher
price.

In hardware the people are satisfied with
a cheaper grade of goods, provided they can
have them at prices to correspond. In the
article of machetes, an implement in very
common use (everybody carrying it in his
belt by day and putting it under his head at
night), such an instrument costs in the United
States from \$6 to \$12 per dozen, while
something of the kind answering every pur-
pose, though of an inferior quality, can be
had in Birmingham for from \$2 to \$3. The
American production is worth the difference,
but the people do not want to pay for it. In
other words, the manufacturer in trying to
excel overshoots the mark, losing his custom-
er in the attempt. If the cheaper trade is
worth having, it is argued, we should adapt
our goods to the market.

An embarrassment to trade for which
there is no immediate prospect of relief is
the high rate of freight resulting from the
monopoly, as alleged, of the Panama Rail-
road Company. The consequence is that
goods have been known to be sent first to
Europe and thence around the Horn to the
West Coast of Central America for less
money than if shipped direct.

Locomotives for Australia.

During the Centennial Exhibition much
attention was given to the locomotives from
the works of Burnham, Parry, Williams &
Co., of Philadelphia. Mr. Morris, the Aus-
tralian Commissioner, who had considerable
experience in the colonies, made suggestions
to the above firm in regard to Australian
requirements until finally the firm proposed
to build a sample engine and send it to
Australia free of cost, on the understanding
that it would be allowed to run over the
railroads in that country on its merits. In
Australia, it may be mentioned, the railroads
are under the control of the government.
The Commissioner wrote home, obtained the
necessary official sanction, and the construc-
tion of the engine was begun, special care
and attention being paid to every part of its
mechanism. The design was a mixture of
English and American makes. The work
was completed and shipped, and in these
dull times their hearts beat high with antici-
pation.

A couple of months after its departure
Dr. Williams, one of the partners, took
passage for the colonies. When he arrived
at his destination he found the locomotive in
a disabled condition, the tender and a
portion of the machinery having been
broken in the first trial through the careles-
ness of an engineer, who brought it into
collision with a train of freight cars. When
Dr. Williams appeared on the scene the
railroad people, who looked with suspicion
on Yankee workmanship, were about to
retire the engine from further service. As
its construction had involved the firm in an
expenditure of over \$10,000, and as \$500
more would cover the cost of repairs the
"retirement" idea did not meet Dr. William's
approbation. The locomotive was accord-
ingly fixed up, and at its next trial it was
successful in drawing no less than 36 well-
loaded cars. This result astonished the
colonists. The government purchased the
engine without further ado, and followed it
up with an order for another just like it and
two heavy freight engines.

The contract has been completed and the
engines will be dispatched for their destina-
tion by the clipper ship Colorado, which leaves
New York for New South Wales on the 1st
proximo. The passenger locomotive is of
the type used in American railroad practice,
but with some features of construction ac-
cording with the usages prevailing in the
colonies. It has cylinders 18 by 24, driving
wheels 63 inches in diameter, and a four-
wheeled swinging bolster truck with wheels
30 inches in diameter. The total wheel base
of the locomotive is 21 feet 6 inches, and of
locomotive and tender, 43 feet 6 inches.
The tender is on four-wheeled trucks, in ac-
cordance with the American practice. The
tender wheels are 36 inches in diameter. All
the truck wheels for both engines and ten-
der are steel tired.

The two freight engines are of the con-
solidation type introduced by the Baldwin
Works several years ago. They are the
largest and most powerful engines which
have ever been made in the world. They
weigh when in full working order, exclusive
of tender, 102,000 pounds each. Their di-
mensions are as follows: Cylinders, 20 by
24; eight driving wheels in front, 30 inches
in diameter; 1 pair of pony truck wheels
in front, 30 inches in diameter, with swing-
ing bolster and radius bar; total wheel
base of engines, 22 feet 10 inches, and of
engine and tender, 45 feet 11 inches.

The strength of these locomotives can be
imagined from the fact that at recent ex-
periments one of them drew 160 empty cars,
making a train 1 mile in length. They are
guaranteed to draw from 90 to 100 loaded
cars each trip. The English have hitherto
had the exclusive control of the locomotive
market of the colonies, and the fact that the
government has been induced by superior
merit to transfer its custom to an American
house, has occasioned no little alarm among
them, especially as they admit that they are
unable to compete with such workmanship.

A notable improvement in watches is re-
ported from Chaux de Fonds, Switzerland.
By a peculiar process the figures on the dial
are rendered luminous, so that if exposed
once during the day to the sunlight they re-
main phosphorescent and visible throughout
the night. Preparations are being made
for the production of these watches on a
large scale.

RUSSELL & ERWIN MANUFACTURING COMPANY

Manufacturers of HARDWARE.

FACTORIES, - - - NEW BRITAIN, CONNECTICUT, U. S. A.

MANUFACTURERS' AGENTS AND DEALERS IN GENERAL HARDWARE AT OUR

WAREHOUSES: NEW YORK, 45 & 47 Chambers Street; PHILADELPHIA, 425 Market Street; BALTIMORE, MD., WM. H. COLE, Agent, 17 South Charles Street.

DOOR LOCKS, KNOBS, Etc.

See our new lines of Rim and Mortise Locks, with our **PATENT ALL STEEL NICKEL-PLATED KEYS**, at
GREATLY REDUCED PRICES.

REAL BRONZE BUILDERS' HARDWARE.

Locks, Knobs, Hinges, Bolts, Escutcheons, etc., in different styles of finish.

"Kahala" Bronze Locks, Knobs, Escutcheons, Butts, Bolts, Cupboard Catches,
Sash Fast, Drawer Pulls, &c.

POLISHED FIRE IRONS, IRON AND BRASS HEAD SHOVELS AND TONGS, HALE'S PATENT MEAT CUTTERS, BAKE PANS.

PADLOCKS.

CABINET LOCKS.

WOOD SCREWS, - - Complete Assortment.

ROUND HEAD NICKEL-PLATED SCREWS.

$\frac{1}{8}$ INCH.	$\frac{3}{16}$ INCH.	$\frac{1}{4}$ INCH.	$\frac{5}{16}$ INCH.	1 INCH.	$1\frac{1}{4}$ INCH.	$1\frac{1}{2}$ INCH.	$1\frac{3}{4}$ INCH.	2 INCH.	$2\frac{1}{4}$ INCH.	$2\frac{1}{2}$ INCH.	$2\frac{3}{4}$ INCH.
Per Gross.	Per Gross.	Per Gross.	Per Gross.	Per Gross.	Per Gross.	Per Gross.	Per Gross.	Per Gross.	Per Gross.	Per Gross.	Per Gross.
No. 4, \$0.84	No. 8, \$1.40	No. 10, \$1.65	No. 11, \$1.85	No. 11, \$1.94	No. 11, \$2.10	No. 10, \$2.15	No. 7, \$2.15	No. 9, \$2.40	No. 10, \$2.85	No. 10, \$3.45	No. 14, \$4.60
5, 0.93	9, 1.55	11, 1.82	12, 2.00	12, 2.10	12, 2.25	11, 2.38	8, 2.20	10, 2.50	11, 3.00	11, 3.55	16, 5.40
6, 1.07	10, 1.63	12, 1.95	13, 2.35	13, 2.45	13, 2.60	12, 2.50	9, 2.30	11, 2.70	12, 3.25	12, 3.65	18, 6.55
7, 1.20	11, 1.80	13, 2.30	14, 2.50	14, 2.70	14, 2.80	13, 2.85	10, 2.40	12, 3.00	13, 3.75	13, 4.00	20, 8.15
8, 1.35	12, 1.90	14, 2.45	15, 2.75	15, 2.95	15, 3.24	14, 3.15	11, 2.55	13, 3.45	14, 4.00	14, 4.25	3 INCH.
9, 1.50			16, 3.10	16, 3.35	16, 3.68	15, 3.50	12, 2.80	14, 3.75	15, 4.30	15, 4.75	No. 14, 5.00
10, 1.60	$\frac{3}{8}$ INCH.	$\frac{7}{8}$ INCH.	1 INCH.	$1\frac{1}{4}$ INCH.	17, 4.00	16, 3.90	13, 3.12	15, 4.05	16, 4.80	16, 5.10	16, 6.10
$\frac{5}{8}$ INCH.	No. 4, .90	No. 6, 1.21	No. 6, 1.27	No. 6, 1.50	18, 4.40	17, 4.40	14, 3.45	16, 4.40	17, 5.20	17, 5.55	18, 7.55
No. 4, .88	5, 1.04	7, 1.34	7, 1.40	7, 1.55		18, 4.80	15, 3.80	17, 5.00	18, 5.70	18, 6.10	20, 9.15
5, .98	6, 1.16	8, 1.47	8, 1.53	8, 1.65	$1\frac{1}{2}$ INCH.	20, 5.85	16, 4.10	18, 5.40	20, 6.75	20, 7.30	
6, 1.13	7, 1.30	9, 1.61	9, 1.68	9, 1.80	No. 7, 1.88		17, 4.60	20, 6.50			
7, 1.25	8, 1.44	10, 1.69	10, 1.75	10, 1.95	No. 8, 1.94		18, 5.10				
	9, 1.57				9, 2.05		20, 6.05				

We have in stock a complete assortment of above, of our own manufacture.

We also offer a full and complete stock of Hardware as Manufacturers' Agents, or at Manufacturers' Prices.

Russell, Burdsall & Ward's Bolts.

Judd & Blakeslees, Wrought Brass Butts, &c.

Stanley Works, Wrought Butts, Bolts, &c.

Union and American Spring Hinges.

Torrey's, Gray's, Gem, Star and Challenge Door Springs.

Clark's, Shepard's and Parker's Blind Butts.

Ausable, Globe, Vulcan and Clinton Horse Nails.

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Nicholson Files, Heller's Horse Rasps.

Disston's Saws and Files.

Girard Wrenches, Spofford Braces.

Ogden's Best Cast Steel Axes, Hatchets and Hammers.

" " " " Shears and Scissors.

Steel Squares, Stocks and Dies.

Lawrence Curry Combs.

Maydole's and Hammond's Cast Steel Hammers.

Sole Agents for the

DOUGLASS MFG. CO., JAMES SWAN, Successor, AUGERS, BITS, CHISELS, DRAWING KNIVES of the best quality.

COOK'S PATENT AUGERS AND BITS.

Cutlery.

FRIEDMANN & LAUTERJUNG,
Manufacturers of **PEN AND POCKET CUTLERY.**
Solid Steel Scissors, Shears, Razors,
Russia Leather Straps, Hones, &c.
Sole proprietors of the renowned full concave patent
"ELECTRIC RAZORS,"
And the celebrated "ELECTRIC SHEARS." Nickel Plated
Hones.
Agents for the **BENGALL RAZORS.**
AMERICAN TABLE CUTLERY, BUTCHER KNIVES, &c.
1 Chambers and 73 Reade Sts., N. Y. 423 N. Fifth St., ST. LOUIS, MO.

MERIDEN CUTLERY CO.
The Oldest Manufacturers of Table Cutlery in America.
The "PATENT IVORY" HANDLE TABLE KNIFE.

CELLULOID
HANDLE FOR TABLE CUTLERY. A most beautiful and perfect substitute for Ivory. Also makers
of all kinds of **TABLE, BUTCHER AND HUNTING KNIVES.**
Illustrated catalogues with prices sent to the trade on application. 49 Chambers St., New York.

LAMSON & GOODNOW
88 CHAMBERS ST. N.Y.
MFG. CO.
AMERICAN TABLE CUTLERY &c.
ESTABLISHED 1855.

AARON BURKINSHAW,
Manufacturer of Pen and Pocket Cutlery, Pepperell, Mass.
My Blades are forged by hand from the best Cast Steel, and warrant-
ed. To me was awarded the Gold Medal of the Conn. State Agricultural Society.

HALL, ELTON & CO.,
Electro Plated Ware, German Silver and Britannia Spoons.

THE "ORLEANS."
Factories, Wallingford, Conn. Salesroom, 75 Chambers Street, New York.

THE FRARY CUTLERY COMPANY,
FACTORY, BRIDGEPORT, CONN.
NEW YORK OFFICE & WAREHOUSE, with WIEBUSCH & HILGER HARDWARE CO., 84 Chambers St.
Manufacturers of all kinds of Table Cutlery.

FRARY CUTLERY CO. PAT. JULY 4, 1876. OCT. 10, 1876.
FRARY CUTLERY CO. PAT. JULY 4, 1876. OCT. 10, 1876.

The above illustrations represent their New Patent Screw Tang Lock Fast Solid Handle Knife.
There is no question but that a solid handle knife is much more preferable than a scale tang. The great objection to their use hitherto is, that no solid wood handle has been placed on the market with the handle properly secured—no handle put on with cement will stand the wear and tear of every day usage. The cement will expand and contract with the action of heat and cold, and become loose, crack and come off, causing great prejudice against their use. This objection is overcome in our patent screw tang. A wood screw is welded to the tang of the knife or fork, and screwed firmly and securely in the handle and locked there by the bolter, making a very strong neat and handsome knife, which we warrant never to get loose, crack or come off. We manufacture a large variety of patterns, both Table, Butcher and Carvers, and furnish the patent handle nearly as low as the scale tang. We are prepared to furnish this line of goods, together with the scale tang and iron handle, very promptly, and very respectfully invite the attention of the trade.

HOLROYD & CO.,
Waterford, N. Y.

CLARK'S PATENT EXPANSIVE BITS
Made of JESSOP'S BEST CAST STEEL, and warranted superior to any other
Two sizes: Large Size Boring, 3/4 to 3 inches; Small Size Boring, 1/4 to 1 1/4 inches.
W. A. CLARK'S PATENT.
Manufactured by
WILLIAM A. CLARK, - - - **Westville, Conn.**

Cutlery.

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134 & 136 Duane Street, New York,
SOLE WHOLESALE AGENTS
CLARK'S
PATENT HORSE CLIPPER

Five styles. Fully described by our circular and price list, which we will send on application.
The genuine are stamped on both the wooden and metal parts, as shown in the illustration, as a protection against inferior imitations.
All repairs executed with care and dispatch.

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POCKET KNIVES

The assortment of Gardner's Celebrated Barlow Knives has been increased, and they are now furnished with Rubber, Bone, Stag and Wrought Iron Handles.
All of Gardner's Patent Knives are fully warranted.

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Manufacturers of FINE PEN & POCKET CUTLERY.
FULLER BROS., Sole Agents, 89 Chambers and 71 Reade Sts., N. Y.

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MANUFACTURERS OF
Improved
Carpenters' Tools.
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New Britain, Conn.
WAREHOUSES,
29 Chambers St.,
New York.

JOSEPH S. FISHER,
No. 411 Commerce St., PHILADELPHIA
AGENT FOR
George Wostenholm & Son,
"Limited."
Washington Works, SHEFFIELD,
Celebrated I-XL Cutlery, Razors, &c.

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Steel and File Manufacturers,
Rotherham, ENGLAND.
Corporate Mark.
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ROTHERHAM
Granted 1777.

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CORPORATE MARK,
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Joseph Rodgers & Sons'
(LIMITED)
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No. 82 Chambers Street, New York.
F. & W. CLATWORTHY, Agents.
The demand for Joseph Rodgers & Sons' productions having considerably increased, they have, in order to meet it, greatly extended their Manufacturing Premises and Steam power.
To distinguish Articles of Joseph Rodgers & Sons' Manufacture, please to see that they bear their Corporate Mark.

NEW YORK KNIFE CO.
MANUFACTURERS OF SUPERIOR
Table & Pocket Cutlery,
WARRANTED TO BE MADE OF THE BEST MATERIAL.
WALKILL RIVER WORKS,
Walden, Orange Co., New York.
THOS. J. BRADLEY, President.

ALFRED H. HILDICK,
12 Warren St., N. Y.
Importer of CHAINS, ANVILS, VISES, &c.
Agency of
HILL BROTHERS & CO., WALSALL, ENGLAND,
GENERAL HARDWARE MERCHANTS,
And of
BALL'S PAT. SOLID STEEL SHEEP SHEARS.
These shears are unsurpassed for cheapness, durability and utility. They are made of one solid piece of steel from point to point, and cannot be broken in use either in the bow or at the junction of the shank and blade. Samples can be seen at above address, or sample lots furnished.

KRAUSS & HAHN,
Importers, Manufacturers and Dealers
In all kinds of
Cutlery and French Grindstones,
152 Centre, cor. Walker St., N. Y.
Ground slides Razors of all brands imported and conveyed by steam power for the trade. Price for concealing from \$3 to \$5 per dozen. Price list sent on application.

Wilson Bohannon,
Manufacturer of Patent
BRASS
Pad Locks,
FOR
Railroad Switches, Freight Cars,
and the Hardware Trade.
All sizes, with Brass and Steel
Keys, with & without chains.
Passenger Car Locks,
Bronzed, Nickel-Plated and
Japanned.
Patent Tubular Night Latches.
Will answer for Doors from 1 1/4 to 2 inches.
BROOKLYN, N. Y.
Catalogues and Samples sent upon application.

Fire-Brick Stoves.

Mr. W. Whitwell, executor of the late Mr. Thomas Whitwell, has sent to the Secretary of the American Iron and Steel Institute the following letter, which is probably the last written by the deceased gentleman in connection with his useful invention. Besides the interest it will command as such, it contains statements which the high professional capacity of the author will render valuable:

THORNABY IRON WORKS, STOCKTON-ON-TEES, AUGUST 3, 1878.
To the Secretary of the American Iron and Steel Association—SIR: The discussion in the Bulletin on fire-brick stoves up to July 10th and 17th has been forwarded to me. Excuse me making a few remarks on it.

On page 149 "S" remarks: "To thoroughly clean an oven it must be cool enough to admit scraping the walls, which can be done only by workmen inside, no matter what the construction." Fallacious assertions do not forward truth. The English plan for ten years of cleaning my stoves is as follows: The brickwork contractor has £2 for the job. His men quit work for the day when the stove is cleaned. A draughtsman watches the contractor, who starts at 6 a. m., on a perfectly hot stove if desired, takes off the top doors, and rakes down the red-hot walls with rakes and gas-pipe handles or a windlass and chain; by 10 a. m. (half an hour for breakfast allowed), the top doors are on and air tight, the bottom doors are opened and the dust cleaned out; by 11 to 11.30 a. m. the cleaning is ended, the men leave and the stove goes on blast for another two months. Four and a half hours six times a year is the total time a stove is off blast. If your American practice is behind the English the sooner you "hurry up" the better.

Page 161. The agents of the Siemens-Cowper-Cochrane stove write that they blow out the dust. When these gentlemen have stoves on spiegelisen gas they will find that the fungus made by the gas will block up all their squares, and is not to be blown out. They also draw an unfavorable comparison between my stoves and theirs. I would here again quote the line with regard to "fallacious assertions." I started my fire-brick stoves ten years after Siemens, Cowper and Cochrane. I am now about 400 stoves ahead, and have in the United States sixty-five stoves against their three.

Now as to the time of changing valves. We have one man to attend the nine stoves for three blast furnaces. Granted that he has cold-blast, chimney, gas and hot-blast valves to change and three air inlets, he does the lot in two and a half minutes—not twenty, as Messrs. Taws and Hartman assert. He has nine stoves at work, changes one per hour on each furnace, has ample time for meals and gets 4/3 per shift of twelve hours. Our stove minders constantly put one oven on blast and one on gas at each furnace, and change the three furnaces in twelve to fifteen minutes for the lot; so that we change eighteen valves in two minutes and ten seconds—not each valve in two minutes. Such is the value of printed assertions. O tempora! O mores! The stove minder and the keeper consult constantly and regulate the blast to suit the slag and iron and get wonderfully regular results.

As to the heating surface required to heat a certain quantity of blast, you will kindly note that, if the blast passes over every foot of surface, as in my stoves, much less heating surface is required than in the Siemens-Cowper-Cochrane ovens, as the blast, taking the line of least resistance, traverses only a few of the passages in their oven and leaves a large number untouched. Now, surface is of no use unless you utilize it, and the German engineers found several years ago that, though I had only a comparatively small heating surface, yet that I heated the same amount of blast furnace as Cowper did with six times the amount of surface. Why? Because by my system I had a visible combustion in every part of my gas passages, regulated by the air valves; whereas, the Siemens-Cowper-Cochrane oven gets the cream of its heat in one stratum only, and this is carried off by the first wave of blast: the gas, unable to burn in a tube as is well known, goes out, and hence a vast amount of surface that cannot be utilized is provided by them for no purpose.

As to the cost of cast iron and fire brick ovens. Quoting Blockow, Vaughan & Co.'s new Eston furnaces as the most modern example, the cost to make 500 to 600 tons of Bessemer pig iron per week is thus, with cast-iron stove, about £5000; with my fire-brick stoves, three in number, to make 560 tons of Bessemer pig iron per week, the cost is £2796; the best fire-bricks, costing 45/ per 1000,—27,000 feet of surface in my ovens—will make 560 tons of pig iron per week. The outrageous prices charged for fire-bricks in the United States are a great bar to their use in ovens. A little good competition is wanted to bring things to a reasonable level.

On page 149 "S" says my zinc tests are not accurate. All I can say is, we buy pure commercial spelter, and cast it into one-fourth inch sticks; test every stick, and reject all oxidized and cold shot pieces. I can only surmise that the zinc "S" used had solder or tin in it, and this accounts for his readings. Red-hot tuyere pipes and a temperature of 1680° will not melt English zinc in one second. On account of radiation we hold the stick of zinc an inch into the tuyere hole, so that the stick is evenly surrounded by the hot blast. I may say that Hobson's pyrometer (Mr. Henry Hobson, of Workington,) agrees with the new Gauntlett and Siemens, and is the most easily managed; it is very accurate and does not change its character, being mercurial.

Messrs. Taws and Hartman assert that the variation of temperature in their stoves is 60°. Mr. C. O. Parsons informs me that at the Pennsylvania Steel Co.'s Works, at Harrisburg, Pa., the variation with three of my stoves is only 30°, and at most 50°.

Yours, very truly,
THOMAS WHITWELL.

RUSSELL & ERWIN MANUFACTURING COMPANY

Manufacturers of HARDWARE.

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Locks, Knobs, Hinges, Bolts, Escutcheons, etc., in different styles of finish.

"Kahala" Bronze Locks, Knobs, Escutcheons, Butts, Bolts, Cupboard Catches,
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POLISHED FIRE IRONS, IRON AND BRASS HEAD SHOVELS AND TONGS, HALE'S PATENT MEAT CUTTERS, BAKE PANS.

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WOOD SCREWS, - - Complete Assortment.

ROUND HEAD NICKEL-PLATED SCREWS.

$\frac{1}{2}$ INCH.	$\frac{5}{8}$ INCH.	$\frac{3}{4}$ INCH.	$\frac{7}{8}$ INCH.	1 INCH.	1 $\frac{1}{4}$ INCH.	1 $\frac{1}{2}$ INCH.	1 $\frac{3}{4}$ INCH.	2 INCH.	2 $\frac{1}{4}$ INCH.	2 $\frac{1}{2}$ INCH.	2 $\frac{3}{4}$ INCH.
Per Gross.	Per Gross.	Per Gross.	Per Gross.	Per Gross.	Per Gross.	Per Gross.	Per Gross.	Per Gross.	Per Gross.	Per Gross.	Per Gross.
No. 4, \$0.84	No. 8, \$1.40	No. 10, \$1.65	No. 11, \$1.85	No. 11, \$1.94	No. 11, \$2.10	No. 10, \$2.15	No. 7, \$2.15	No. 9, \$2.40	No. 10, \$2.85	No. 10, \$3.45	No. 14, \$4.60
5, 0.93	9, 1.55	11, 1.82	12, 2.00	12, 2.10	12, 2.25	11, 2.38	8, 2.20	10, 2.50	11, 3.00	11, 3.55	16, 5.40
6, 1.07	10, 1.63	12, 1.95	13, 2.35	13, 2.45	13, 2.60	12, 2.50	9, 2.30	11, 2.70	12, 3.25	12, 3.65	18, 6.55
7, 1.20	11, 1.80	13, 2.30	14, 2.50	14, 2.70	14, 2.80	13, 2.85	10, 2.40	12, 3.00	13, 3.75	13, 4.00	20, 8.15
8, 1.35	12, 1.90	14, 2.45	15, 2.75	15, 2.95	15, 3.24	14, 3.15	11, 2.55	13, 3.45	14, 4.00	14, 4.25	
9, 1.50			16, 3.10	16, 3.35	16, 3.68	15, 3.50	12, 2.80	14, 3.75	15, 4.30	15, 4.75	3 INCH.
10, 1.60	$\frac{3}{4}$ INCH.	$\frac{7}{8}$ INCH.	1 INCH.	1 $\frac{1}{4}$ INCH.	1 $\frac{1}{2}$ INCH.	16, 3.90	13, 3.12	15, 4.05	16, 4.80	16, 5.10	No. 14, 5.00
	No. 4, .90	No. 6, 1.21	No. 6, 1.27	No. 6, 1.50	1 $\frac{1}{2}$ INCH.	17, 4.40	14, 3.45	16, 4.40	17, 5.20	17, 5.55	16, 6.10
$\frac{5}{8}$ INCH.	No. 5, 1.04	7, 1.34	7, 1.40	7, 1.55	No. 7, 1.88	17, 4.40	14, 3.45	16, 4.40	17, 5.20	17, 5.55	16, 6.10
No. 4, .88	6, 1.16	8, 1.47	8, 1.53	8, 1.65	8, 1.94	18, 4.80	15, 3.80	17, 5.00	18, 5.70	18, 6.10	18, 7.55
5, .98	7, 1.30	9, 1.61	9, 1.68	9, 1.80	9, 2.05	20, 5.85	16, 4.10	18, 5.40	20, 6.75	20, 7.30	20, 9.15
6, 1.13	8, 1.44	10, 1.69	10, 1.75	10, 1.95			17, 4.60	20, 6.50			
7, 1.25	9, 1.57						18, 5.10				
							20, 6.05				

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Torrey's, Gray's, Gem, Star and Challenge Door Springs.

Clark's, Shepard's and Parker's Blind Butts.

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O. Ames & Sons, Shovels, Spades and Scoops.

Nicholson Files, Heller's Horse Rasps.

Disston's Saws and Files.

Girard Wrenches, Spofford Braces.

Ogden's Best Cast Steel Axes, Hatchets and Hammers.

" " " " Shears and Scissors.

Steel Squares, Stocks and Dies.

Lawrence Curry Combs.

Maydole's and Hammond's Cast Steel Hammers.

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COOK'S PATENT AUGERS AND BITS.

Cutlery.

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Manufacturers of PEN AND POCKET CUTLERY.

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Sole proprietors of the renowned full concave patent

"ELECTRIC RAZORS,"

And the celebrated "ELECTRIC SHEARS." Nickel Plated
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Agents for the BENGALL RAZORS.

AMERICAN TABLE CUTLERY, BUTCHER KNIVES, &c.
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THE "PATENT IVORY" HANDLE TABLE KNIFE.

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HANDLE FOR TABLE CUTLERY. A most beautiful and perfect substitute for Ivory. Also makers
of all kinds of TABLE, BUTCHER AND HUNTING KNIVES.
Illustrated catalogues with prices sent to the trade on application. 49 Chambers St., New York.

ESTABLISHED 1855.



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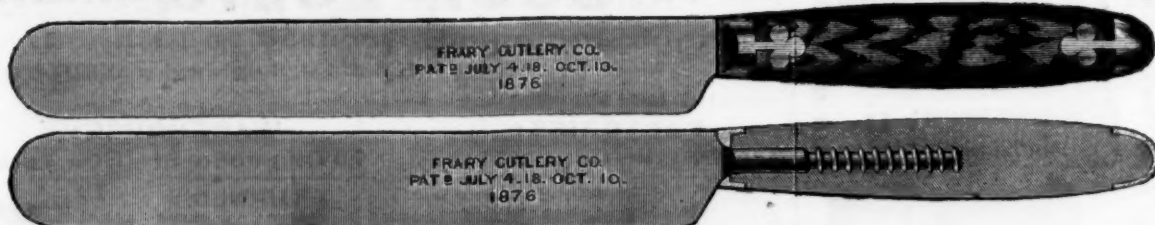
Salesroom, 75 Chambers Street, New York.

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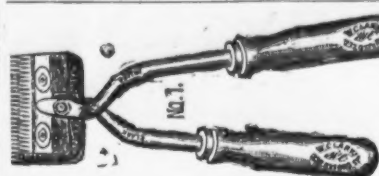
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THORNTON IRON WORKS, 1

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As to the heating surface required to heat a certain quantity of blast, you will kindly note that, if the blast passes over every foot of surface, as in my stoves, much less heating surface is required than in the Siemens-Cowper-Cochrane ovens, as the blast, taking the line of least resistance, traverses only a few of the passages in their oven and leaves a large number untouched. Now, surface is of no use unless you utilize it, and the German engineers found several years ago that, though I had only a comparatively small heating surface, yet that I heated the same blast and burnt the same amount of coke in the blast furnace as Cowper did with six times the amount of surface. Why? Because by my system I had a visible combustion in every part of my gas passages, regulated by the air valves; whereas, the Siemens-Cowper-Cochrane oven gets the cream of its heat in one stratum only, and this is carried off by the first wave of blast: the gas, unable to burn in a tube as is well known, goes out, and hence a vast amount of surface that cannot be utilized is provided by them for no purpose.

As to the cost of cast iron and fire brick ovens. Quoting Blockow, Vaughan & Co.'s new Eston furnaces as the most modern example, the cost to make 500 to 600 tons of Bessemer pig iron per week is thus, with cast-iron stove, about £5000; with my fire-brick stoves, three in number, to make 560 tons of Bessemer pig iron per week, the cost is £2706; the best fire-bricks, costing 45/ per 1000,—27,000 feet of surface in my ovens—will make 560 tons of pig iron per week. The outrageous prices charged for fire-bricks in the United States are a great bar to their use in ovens. A little good competition is wanted to bring things to a reasonable level.

On page 149 "S" says my zinc tests are not accurate. All I can say is, we buy pure commercial spelter, and cast it into one-fourth inch sticks; test every stick, and reject all oxidized and cold shot pieces. I can only surmise that the zinc "S" used had solder or tin in it, and this accounts for his readings. Red-hot tuyere pipes and a temperature of 1680° will not melt English zinc in one second. On account of radiation we hold the stick of zinc an inch into the tuyere hole, so that the stick is evenly surrounded by the hot blast. I may say that Hobson's pyrometer (Mr. Henry Hobson, of Workington,) agrees with the new Gauntlett and Siemens, and is the most easily managed; it is very accurate and does not change its character, being mercurial.

Messrs. Taws and Hartman assert that the variation of temperature in their stoves is 60°. Mr. C. O. Parsons informs me that at the Pennsylvania Steel Co.'s Works, at Harrisburg, Pa., the variation with three of my stoves is only 30°, and at most 50°.

Yours, very truly,

THOMAS WHITWELL,

S. H. & E. Y. MOORE,

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Heavy Hardware & Railway Supplies.

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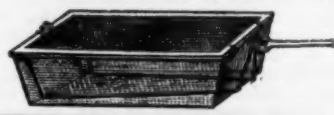
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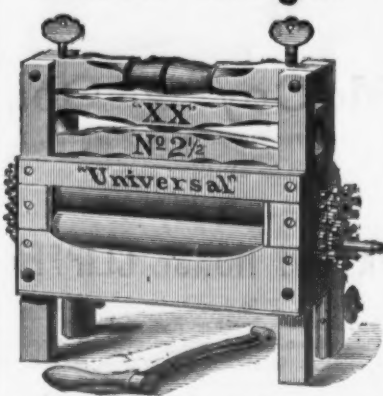
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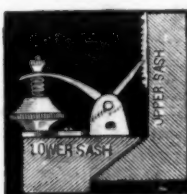
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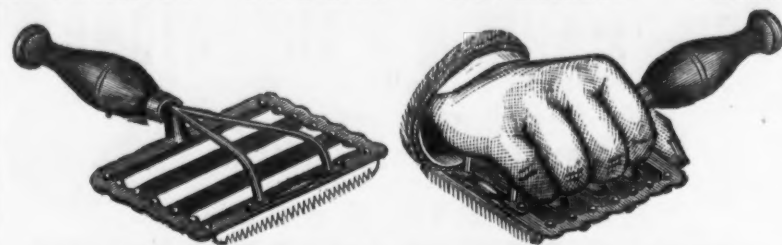


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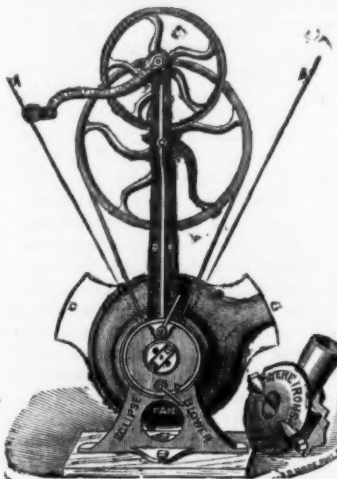
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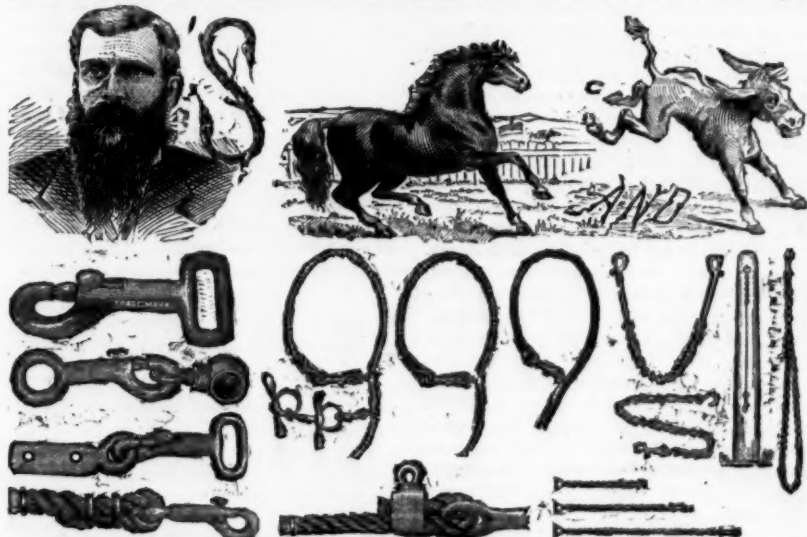
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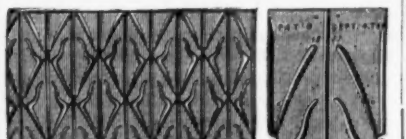
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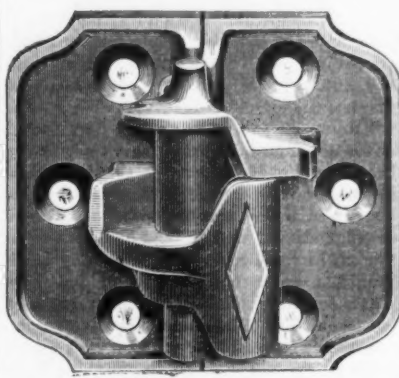


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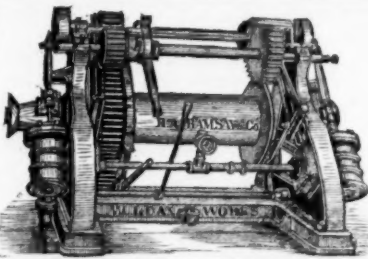
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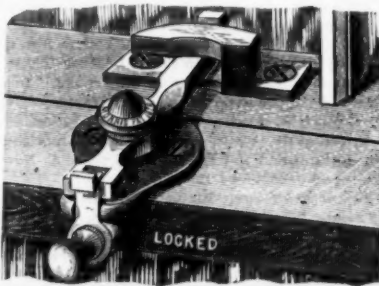
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AND
Metallurgical Review.

New York, Thursday, September 19, 1878.

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AUSTRALIAN AGENCY.

The Australian Hardware Company, Melbourne, are our agents for Australia. Sample copies will be mailed by them, free of charge, to any firm engaged in the trades we represent in Australia, Tasmania and New Zealand.

CONTENTS.

First Page.—The Clayton Air Governor. The Ramsay Steam Winch. American Exports to Europe.
Third Page.—New Patents. Second St. Louis Fair.
Fifth Page.—The Yale Roller Strike. Recent Consular Reports.
Seventh Page.—The Cumberland Coal Fields. An Old Style Fire Engine.
Ninth Page.—The Famine in Morocco. United States Trade with Central America. Locomotives for Australia.
Eleventh Page.—Fire-Brick Stoves.
Thirteenth Page.—An Issue Worthy of a National Labor Party. Respectfully Declined, with Thanks. Copper.
Fifteenth Page.—New Publications. Wages at Pittsburgh. The Operation of the New German Patent Law. St. Louis Safe from Yellow Fever. Opening Europe to the American Leather Trade. Commercial Law Decisions. Ohio Cokes. Discovery of Copper Deposits in Pennsylvania.
Seventeenth Page.—The Paris Exposition.
Nineteenth Page.—Gossip About American Competition and the Exhibition of 1878. A New System of Continuous Rolls.
Twenty-first Page.—Mining Items. Labor Notes.
Twenty-third Page.—Trade Report. General Hardware. Iron. Metals. Old Metals. Paper Stock, etc. Coal. Exports. Imports. Philadelphia.
Twenty-fifth Page.—Pittsburgh. Chattanooga. Boston. Louisville. St. Louis. Baltimore. Richmond. Cincinnati. Foreign.
Twenty-seventh Page.—Our English Letter. The Inventor of Gas Lights. Barff's Process for Protecting Iron against Corrosion. Carbon Bronze. The Ferris System at the Norton Furnace. Glass Industrial Items.
Twenty-ninth Page.—Industrial Items. American Platinized Iron. The Sidley & MacKay Ice Machine. The Woolen Coal Waste Burning Locomotive. The Wheeler Process at the Paxton Mill.
Thirty-first Page.—The Iron Age Directory.
Thirty-third Page.—New York Wholesale Prices.
Thirty-fifth Page.—New York Wholesale Prices. (Continued).
Thirty-seventh Page.—Philadelphia, Buffalo, Chicago and Pittsburgh Hardware and Metal Prices.
Thirty-ninth Page.—Boston and St. Louis. Hardware and Metal Prices.

It seems that the reported order from Valparaiso for pig iron, bar iron, fire-brick, &c., said to have been sent to a Philadelphia concern, was not received. The only basis for the story was that the Diamond State Iron Company shipped some iron to Valparaiso on consignment; but no prices

were fixed, and it has not as yet led to any orders. We found the statement made very circumstantially in one of the Philadelphia dailies, with reports of interviews with local merchants and manufacturers, and were misled by it.

An Issue Worthy of a National Labor Party.

In discussing certain broad truths in political economy we have frequently found it necessary to combat the notion that the general employment of labor-saving machinery is resulting in injury to the working classes. The complaint so often heard that machines are taking bread out of the workingman's mouth, is not true as a broad proposition. It must be confessed, however, that there is some basis of truth in the oft-repeated assertion that the workingmen as a class are losing ground in their competition with labor-saving machinery, and that in times like these, when production is restricted by causes which compel a strict economy of consumption, there is not enough hand work to be done, in supplementing and completing the work of machinery, to give employment to our laboring classes. When the whole drift of a rapid mechanical progress is in the direction of an economy of hand labor, it follows that the amount of a nation's manufactured products must steadily increase from year to year, or else that labor will be crowded out of its productive industries by labor-saving machinery. With us the competition of machinery was not seriously felt by our artisans and mechanics until after the panic of 1873. When the country was discovered to be suffering from what is commonly called overproduction, the unskilled or half-skilled laborer found that for years he had been competing, not with unintelligent machinery, but with a brain power which was producing, with the aid of machinery, results which muscle and mere skill of hand could never accomplish. Brain was superseding brawn, and every success of the intelligent inventor captured some department of production in which the mechanic of average intelligence and skill of hand had considered himself invincible. While production in all branches was steadily increasing and there was a demand for labor, workmen crowded out of one field of usefulness by labor-saving machinery found different and perhaps more satisfactory employment in another, or in preparing work for the machines to do. When our industrial progress was suddenly checked and production was curtailed to meet the changed requirements of trade, it was found that brain power held the field, and that the mechanic with only his skill of hand to depend upon occupied a position of serious and permanent disadvantage.

There are reasons for this which are apt to escape the notice of superficial students of economic questions. One is that the modern system of manufacturing makes machines, rather than mechanics, of a majority of the workmen employed in them. The young man who "learns his trade" in one of our large and well-appointed factories, commonly becomes thorough only in one part of his work. He has no opportunity to become generally proficient, and general proficiency is less valuable to his employers than special skill in some class of work or some specific department of production. Where machinery is employed he learns to run one kind of machine so that it shall render a maximum service, or if his work be hand labor he becomes specially skilled in doing some particular class of work which rarely or never includes the whole process of manufacture. He is not, properly speaking, a mechanic, and if his labor is superseded by that of a machine which can be made to do his work, he finds that he is no longer able to render services in the line of his special knowledge which have a market value, and must perforce change his occupation at a time when he can least afford to learn a trade. Such changes are the inevitable result of the progress of a mechanical age. It is, as we have said, simply a part of the competition between brain power and mere handicraft, in which the latter must remain at a permanent disadvantage.

That the good of the whole people is largely and continuously promoted by a progress which tends to cheapen production and multiply the enjoyments of life, is certainly true. Even the workingman who is crowded out of his particular sphere of usefulness by labor-saving machinery is benefited by the improvement of his general condition in life—in better food and clothing, better shelter and a greater variety of comforts and conveniences than his labor could have purchased half a century ago. As a producer, however, he is at a disadvantage in his competition with the intelligence which is providing mechanical appliances for doing his work better and cheaper than he can do it by hand. His discontent and apprehension of the future is not to be wondered at, considering the fact that he lacks the training which is needed to fit him for higher and more profitable employments than those which he has followed from his youth. Generally ignorant of the economic laws which govern all exchange of services and force every form of productive industry to adjust itself on the basis of the closest practicable economy, he cannot see that he is not wronged. He feels that capital is oppressing labor by using machinery and paying the least wages at which labor can be employed. He deems all laws for the pro-

tection of property rights as oppressive measures enacted in the interest of those who are grinding the poor man. He clamors for relief from the government, for unlimited irredeemable paper currency, for the repudiation of public debts, for any and every wild scheme which specious demagogues present to him as promising desirable results. He becomes, perhaps, a socialist, a communist, or, in extreme cases, a tramp, leagued with other vagabonds and outcasts to make war upon society and live by the plunder of capitalists—namely, those who have something accumulated which those who have nothing can beg or steal. The fact that the country is now overrun with vagrants shows that we have a large class in the community who would rather drift into vagabondage and pauperism than contend with the difficulties encountered in the useful industries by those who are forced to an unequal competition with superior intelligence. The frugal and thrifty adapt themselves to the changed conditions affecting labor; those who lack ambition or who have vicious tendencies do not, and sometimes cannot.

How can labor be protected against a competition which it cannot measure, and which every day brings forth some new machine or makes some new discovery to economize labor? No such protection is possible for the working people as a class. The question is one which every individual workingman must solve for himself. If he can adapt himself to the changed conditions of industry, well and good; if not, he must expect to be crowded out of one trade after another, and to find himself not only competing with brain power, but with unskilled labor as well. The question is one which has an interest for the children of the workingman rather than for himself. He must do the best he can with the limited knowledge he possesses; but he should do what he can to place his children on a higher plane by giving them a better education than he has received. He should use such political power as he has or may acquire through organization, to secure the establishment of technical schools all over the country and to make drawing, elementary mechanics and elementary physics a part of the system of popular education in every State. Owing to his lack of advantages in early life, he is probably unable to join the ranks of the brain workers or the artisans who are beyond the reach of the competition of machinery. He cannot draw, he cannot design, he has no knowledge of the principles of decorative art, he does not understand the laws of mechanics well enough to invent or improve, and he can make no discoveries unless he chances to surprise nature in one of her secrets. Even then he cannot utilize his accidentally acquired knowledge. The machine which displaces him from the occupation he calls his trade, does not open to him new and higher opportunities. It merely throws him "out of work" and he lacks the capacity to render society any other necessary service than mere menial toil. He should see to it that his boys and his girls do not enter life thus handicapped by ignorance.

We cannot imagine an issue on which the workmen could unite with more benefit to themselves or more certainty of securing the support of the educated classes, than in demanding that instruction in branches of knowledge directly and immediately available in the mechanic arts be provided for the children of the workmen of the country. If the uneducated workman now finds himself unable to cope with brain power as applied to production in the shape of labor-saving machinery and processes, how much less will the uneducated of the next generation be able to hold their ground in the unequal contest. Labor unions, strikes and organized opposition to what is called the oppression of capital, will avail nothing in the end. They cannot lock the wheels of progress, and such struggles only end in further depressing the value of unskilled labor by stimulating invention and making labor-saving machinery a necessity. The only salvation of labor is in the higher education of the laboring classes, and to secure this we must provide for the schooling of the children. The workman who can make or read a mechanical drawing is a more valuable man to an employer than one who cannot. The mechanic who can design an appropriate ornament or improve a defective construction does what no machine can do, and is at once raised to the level of the brain worker. The artisan who can originate something beautiful and useful, or even appropriately reproduce beautiful forms and employ them legitimately, is sure of a market for his labor and finds prosperity within his reach.

Once in a while some child of genius rises superior to the disadvantages of early life and makes himself a brain worker, but such instances are exceptional, and they will remain so until we teach the youth of the land that which they can take with them to workshop and factory for daily employment, which will give them an insight into nature and art and enable them to stand among those who lead the progress of the useful arts. We cannot make an inventor or an artist of every boy and girl who may have to depend on labor for support, but we can raise the standard of intelligence among the working classes, strengthen the brain power behind labor and give those who work with their hands something to depend upon which machinery can never render unsaleable. "Technical education for our children" would be the grandest of all the issues which the workmen could take as a basis

for party organization. It is, moreover, practicable of attainment, and the workingmen would have the satisfaction of knowing that, whatever their own poverty, they were sure to leave their children the best of all legacies—an education which would make them brain workers and open to them spheres of usefulness to which the uneducated mechanic could not hope to attain. Technical colleges do not meet the popular demand. What we want is popular education in matters which the successful, progressive mechanic and artisan need to know. With this provided the United States would quickly attain the front place among the manufacturing nations of the world; machinery would then supplement labor without supplanting it, and our national progress would rest upon a basis of general and substantial prosperity.

Respectfully Declined, with Thanks.

Mr. Gladstone's interesting paper entitled "Kin beyond sea," contributed to the *North American Review*, contains the following suggestive prediction of the future of the United States:

There is no parallel in all the records of the world to the case of that prolific British mother, who has sent forth her innumerable children over all the earth, to be the founders of half a dozen empires. She, with her progeny, may almost claim to constitute a kind of universal church in politics. But, among these children, there is one whose place in the world's eye and in history is superlative; it is the American republic. She is the eldest born. She has, taking the capacity of her land into view, as well as its mere measurement, a natural base for the greatest continual empire ever established by man. And it may be well here to mention, what has not always been sufficiently observed, that the distinction between continuous empire and empire severed and dispersed over sea, is vital.

The development which the republic has effected has been unexampled in its rapidity and force. While other countries have doubled, or at most trebled their population, she has risen during one single century of freedom, in round numbers, from 2,000,000 to 45,000,000. As to riches, it is reasonable to establish, from the decennial stages of the progress thus far achieved, a series for the future; and reckoning upon this basis, I suppose that the very next census, in the year 1880, will exhibit her to the world as certainly the wealthiest of all the nations. The England and the America of the present are probably the two strongest nations of the world. But there can hardly be a doubt, as between the America and the England of the future, that the daughter, at some no very distant time, will, whether fairer or less fair, be unquestionably yet stronger than the mother.

Such predictions are very pleasant, no doubt, and we all hope they will be fully realized; but we think if they are England will manifest a greater desire to matronize the Republic than we shall find agreeable. Those of her "children" who laid the foundations of the American Republic were driven out of Great Britain by religious persecution. We owe her no gratitude for that. When by various means she had acquired the right of sovereignty over thirteen American colonies, her oppression drove them into a revolution which severed the bonds of political union after a long and cruel war. Since that we have built up a nationality out of all sorts of incongruous elements, and but little save our language remains to indicate the nucleus around which it has gathered and so quickly acquired strength and greatness. The American people are the most cosmopolitan of all nationalities, and all of our present importance which we owe to England is a good deal less than enough to entitle her to claim very close kinship, much less to assume the maternal attitude and pat us complacently on the head with the assurance that she is proud of her American children. We don't like this kind of thing at all. Britannia is a very respectable old lady no doubt, although she has not always been; but the relation we bore to her in infancy was very much like that in which Smike stood to Mrs. Squeers, and since we set up for ourselves we have only kept up a speaking acquaintance.

A number of interesting facts concerning the French iron ore supply and the rapid manner in which French ironmasters lost the monopoly of the Spanish and Algerian ores, have been revealed by the testimony of M. Jordan before a French committee appointed to examine the causes of, and suggest remedies for, the depression of industrial enterprise. In 1860 France chiefly manufactured iron and steel of superior quality. It sustained its reputation by the rich, pure ores of the Mediterranean, from its possessions in Algiers, from Italy, Elba and Spain. Until 1871 and 1872 France, to a certain extent, enjoyed a monopoly of smelting these ores, but in 1872 and 1873 the English arrived, and they have carried off such quantities that now they consume as much as France. A large number of German and English mining companies were organized in Spain, and the English also commenced mining Italian ore, and are now working at least two large deposits in Algiers, without counting the purchases they make from local companies like the Mokta-el-Hadid. Favored by high prices, English, Belgian and German operators provided facilities for transportation to which those of the French carriers cannot be compared, and the furnaces of Wales, Newcastle and Scotland were thus supplied. The result of this organization is that English and German works can now obtain Spanish and Algerian ores cheaper than the French ironmasters.

From Germany comes a second earnest appeal to our inventors and attorneys not to neglect certain precautionary measures in taking out German patents. The letter of our correspondent, which at the same time gives some interesting statistical data, places

the matter in a strong light, and we cannot help joining in his expressions of regret that the German patent law, in other respects so liberal, should contain clauses which in their present strict application render many valuable rights worthless, and introduce an element of unsafety in patents already acquired.

Copper.

The decline in the value of copper has not been quite so precipitate during the past few years as with other metals of commerce, but it has been more continuous. But few great speculative movements for a rise have been attempted, and whenever undertaken they have been of short duration, and invariably disastrous to the operators both in London and at New York. This slow but uninterrupted decline in the leading metal has caused the greater surprise from the fact that various notable circumstances have arisen during this period of falling values which seemed well calculated to compel an advance in prices. Among them may be noted the introduction of phosphor-bronze, and its extensive use for the casting of field pieces, machine bearings, &c., and the armaments which preceded the Russo-Turkish war and their continuation while it lasted absorbing enormous quantities of copper for cartridges, extensively manufactured not only by the belligerents, but by all the remaining warlike nations of Europe.

If general trade suffered from causes we have often had occasion to explain in these columns, it was hoped that in the case of copper this extra demand would make up for the shortcomings in the requirements of peaceful industry, and at least steady the price. But in this the metal trade has been disappointed, for new sources of supply have been thrown open, swelling the aggregate production of the world to a figure which would have seemed improbable four or five years ago. Chief among these sources is the Rio Tinto mine, near Huelva, in Andalusia, Spain, one of the oldest cities in Europe, founded by the Phoenicians nearly 3000 years ago, and by them called Onuba. That copper existed in the neighborhood was probably no secret, even to the founders of the city. The mines later on became the property of the State, and some eight years ago the government, during a period of financial distress, alienated these magnificent mines, selling them to a syndicate of German bankers, who in their turn resold them to London capitalists, who are now working them. The actual output reduced to pure copper may safely be put down at 10,000 to 12,000 tons annually.

While this old Spanish mine of Phœnician origin was thus revived with all the advantages which modern mining, cheap labor and short and easy carriage to port ensure, backed by plenty of capital, another old mine was resuscitated in Venezuela, and though not as favorably situated financially, it will have to be taken into account in the future. Even Newfoundland now produces a goodly share of the copper supply. Copper mining in Chili, at the Cape and in Australia and Japan has been proceeding more vigorously than ever, and there certainly has been no falling off in this country, for if Tennessee for the moment produces less than formerly, North Carolina is becoming more important in its place, and we have not yet heard of any reduction in the output of Lake Superior, despite the low price. Even England still turns out from native ores 4000 to 5000 tons.

Since a peace has been reached in Europe which possibly may last a couple of years, the purchases of and for cartridges have ceased for the present, and it is not easy now to procure orders for copper from Europe even at prices below the present low ruling. The demand for American brass goods has for nearly a year past been about as dull as it possibly can be, with little prospect of a great revival during the fall and winter months. Under these circumstances we do not see much to encourage holders. The demand for India may revive and make itself felt at London, and the low price of copper may cut down production in Chili; but there are as yet no signs of either in the immediate future, and the statistical position of copper in Europe apparently grows worse from month to month. The following table will show this very clearly:

VISIBLE SUPPLY OF COPPER IN ENGLAND AND FRANCE.		
	Tons.	Price of Chili Bars. £69.
1877—Aug. 1.....	34,513	67.
Sept. 1.....	35,437	67.
Oct. 1.....	36,239	66.
Nov. 1.....	36,127	65. 10/
Dec. 1.....	36,861	63. 10/
1878—Jan. 1.....	36,713	66.
Feb. 1.....	37,759	66.
March 1.....	40,535	65.
April 1.....	41,460	63. 10/
May 1.....	42,735	62.
June 1.....	42,800	64. 10/
July 1.....	41,782	64.
Aug. 1.....	43,325	61. 10/
Sept. 1.....	44,955	60. 15/
1874— ".....	33,159	78.
1875— ".....	39,342	82.
1876— ".....	39,548	79.
1877— ".....	35,437	67.

The charters on the West Coast during the first seven months of 1878 were 26,250 tons, against 25,100 during the corresponding period of 1877, but may shortly increase in view of the suspension of specie payments in Chili, which is likely to stimulate the export of copper. Experience teaches that the introduction of an irredeemable paper currency causes constant fluctuation in exchange and invites speculation in a leading staple merely for the sake of making a good turn on the gold premium. Copper thus becoming the foot-ball of the speculator it is shipped the more extensively, regard-

less of price in Europe, the gambler in exchange having made his profit on it ere the article leaves port.

The following table shows the enormous decline in the price of copper in the market, which has been 50 per cent. since May, 1873:

Month	1873	1874	1875	1876	1877	1878
January	33	30	23 1/2	23	19 1/2	17 1/2
February	34 1/2	35	32	23 1/2	19	17 1/2
March	34 1/2	35	32 1/2	23 1/2	19 1/2	17 1/2
April	34 1/2	35	32 1/2	23 1/2	19 1/2	17 1/2
May	34 1/2	35	32 1/2	23 1/2	19 1/2	17 1/2
June	34 1/2	35	32 1/2	23 1/2	19 1/2	17 1/2
July	34 1/2	35	32 1/2	23 1/2	19 1/2	17 1/2
August	34 1/2	35	32 1/2	23 1/2	19 1/2	17 1/2
September	34 1/2	35	32 1/2	23 1/2	19 1/2	17 1/2
October	34 1/2	35	32 1/2	23 1/2	19 1/2	17 1/2
November	34 1/2	35	32 1/2	23 1/2	19 1/2	17 1/2
December	34 1/2	35	32 1/2	23 1/2	19 1/2	17 1/2

A great many people will of course be inclined to reason that after a decline so enormous in the short space of five years, the time can hardly be distant when copper will have reached its intrinsic value—the cost of production—and will then invite speculation, or that it will react even without the assistance of the latter, as has been the case with lead and spelter quite recently. They may or may not be right in this supposition; but at all events it cannot be denied that this latest phase, the Chilean financial and industrial crisis, places a new face upon the entire copper question. There are possible developments altogether beyond our means of judgment, and we can only draw conclusions from what is, leaving the future to determine what is to be. The threatening relations between Chili and the Argentine Republic, brought about by a frontier dispute, may at any moment lead to war, and this, if prolonged, could hardly fail to interfere with the production of copper on the West Coast.

Among the changes which the proposed commercial treaty with France contemplates are reductions in the American duties on French fancy and leather goods from 35 or 40 per cent. to 30 per cent.; on French silks from 60 per cent. to from 50 to 40, and in the second year to 30; on wine in casks, 20 cents a gallon; in bottles, 50 cents a dozen, and for brandies, \$1 per gallon, in place of the present duties of 85 per cent. on wine in casks, 51 per cent. on champagnes and 104 per cent. on brandies. These propositions have not as yet been approved even in the remotest way by the government of either nation, and are at present the work of two committees that are composed, no doubt, of able men, but are self-constituted so far as the governments are concerned. It will be in order, before any such reductions should even be discussed, to ask if the French nation are ready to grant corresponding concessions on goods that are made in this country and are now absolutely prohibited. Will they open their market to our car-wheels, for example? Will they admit our cotton textiles, now absolutely prohibited, while they export to us some millions of dollars' worth of the same goods annually? The American theory, to be sure, has been that each nation should attend to these matters itself, and we still hold to it; but when our French friends invite us to revise our tariff in the interest of their productions, it is germane to ask reciprocity. We confess, however, that we see little prospect of the adoption of the recommendations of the committees.

There are prospects of a serious strike among the table glassware factories at Pittsburgh. On Monday morning the workmen gave the manufacturers a list of the number of each article that shall constitute a "move." The list contemplates a reduction of about 25 per cent. on the quantity that has heretofore been made. What action the manufacturers will take on this matter is not known, but either they will accede to it or there will be the most extensive strike known in the annals of the glass trade of Pittsburgh and vicinity. The workmen seem determined to drive the glass trade from Pittsburgh. They have virtually destroyed its business in chimneys, and now they are attacking the tableware business. There are 24 factories of this ware in Pittsburgh, which produce 15,000 tons of glass yearly, valued at \$2,250,000.

Mr. John Wilson's dispatch to the State Department concerning American exports to Europe, is of interest to all who are interested in extending their trade with foreign markets, as it contains much that appeals directly to a large class whose interest in foreign trade does not warrant unsupported individual action. Mr. Wilson, pointing to the obstacles which the prejudice against American innovations places in the way of trade, urges the employment of recognized resident agents of associated American exporters. Such agents ought, he claims, to derive their pay from commissions on sales, and devote their full energies to overcoming prejudice by persistently proving the superiority of American goods. He cites a number of articles the lack of which we know by personal experience are felt by American travelers in Europe, and the value of which is attested by Europeans after a brief residence in this country.

Elsewhere we print a series of recent consular reports of interest and value to manufacturers and exporters. Those now at hand come from Geneva, Liverpool, Cardiff, Genoa and Tangiers. Sound advice is given to those dealing with Switzerland, while our consuls at British cities give some valuable statistics on emigration from Liverpool and concerning the wages paid in Wales. Simi-

lar data comes from Genoa, together with a statement which proves that hard times do not spare even Italy, poor though she may be.

Although it bears a somewhat controversial character, the letter by the late Mr. Thomas Whitwell, which we publish in another column, deserves careful perusal by those who admired the energy of the eminent inventor and metallurgist, as well as by those who seek facts and figures in regard to an apparatus which is deservedly popular with inventors in this country. As stated in a letter by Mr. William Whitwell to the secretary of the Iron and Steel Association, the communication to which we refer is probably the last written by Thomas Whitwell on subjects connected with his stove. In its directness of statement and vivacity of style it is characteristic of the man.

Don Jose Baiz, Consul-General for Guatemala, in conversation with a representative of *The Iron Age* gives his views on the reasons for the limited trade between that republic and the United States, and makes some suggestions looking to the establishment of closer commercial relations between the two countries. We understand that the mineral wealth of Guatemala is really great, and that some years ago the country was examined by competent experts at the instigation of the California millionaire, Ralston, whose sudden death, however, caused the abandonment of the explorations.

Hardly have we begun to realize the terrible famine which has desolated large and populous districts in China, when an urgent appeal comes to us for aid through the American consul at Tangiers, where want of rain has so completely ruined the crops that the only hope of the population of Morocco is in foreign aid. We refer to a communication in another column for further details.

New Publications.

COAL AND IRON IN ALL COUNTRIES OF THE WORLD. By J. Pechar, railway director in Tepitz. Published by John Heywood, of Manchester, England, and Simpkin, Marshall & Co., London.

Mr. Pechar's work, written originally in German, has been simultaneously published in French and English. While professing to be only a compilation of the statistics of the iron and coal trades, which furnish the bulk of a volume of over 200 pages, some space is devoted to concise general statements of the present condition and future prospects of the various countries of the world, prices of labor, &c. There is one point which the author seems to have persistently and patiently elaborated, viz., the development of the steel industry. His import and export statistics are, like those of output and production, extensive and in some cases exhaustive, some countries being elaborated by statistics of local fame. The author has in all cases sought the best and most reliable sources, as his array of literature quoted proves. The statistics of the British coal industry are carried into detail for the different principal districts, short descriptions of which are given, the figures including 1876. The author concludes the chapter with concise statements respecting labor, prices, present condition and future prospects of the trade. The English iron ore and iron and steel industries are partially carried up to 1878. The data for France will be found to be exhaustive; and while the latest official statistics of iron for that country do not go further than 1872, the figures given, based upon the Administration des Mines, are not likely to be far out of the way. They include 1877, and give the production of the various "départements" in detail. The Belgian coal statistics were contributed by Max Goebel, C. E., publisher of the *Semaine Industrielle*, but the figures for iron are rather incomplete, as they do not generally reach further than the year 1876. Germany and Austria, considering the fact that the author has been able to devote his special attention to them, are full and up to date; and it is with pleasure that we point to the representation of Russia, which occupies considerable space. It is only to be regretted that Russian official statistics at the time of the publication of Mr. Pechar's work included only the year 1875. The same applies to Sweden, the more elaborate figures of which for iron and steel cover only the year 1875. The United States absorb a large share of the author's attention; his figures are naturally directly and indirectly based upon the well-known labors of Mr. James M. Swank. The rest of the work is divided among the less important countries of the world. On the whole the work may be recommended as a most excellent summary in a very convenient shape. The type is clear and generally well set, and it will prove but little inconvenient to American readers to find pounds sterling and metric tons employed as standards throughout.

Wages at Pittsburgh.—A writer in the *Pittsburgh Leader* gives the following as the wages now paid in the rolling mills of that city. Puddlers are paid \$5 per ton, out of which they have to pay their helper. With the aid of one helper one ton is counted a day's work. The helper gets one-third and five per cent. of the puddler's wages, leaving the puddler \$3 and the helper 1.01 per day. Heaters are paid 65 cents per ton, and the firm furnishes one helper, leaving it to the option of the heater to engage a second helper. Eight tons are generally a day's work, leaving the heater \$5.20 per day, out of which he has to pay \$1.50 to the second helper if he employs one. Bar rollers average about nine tons per day, and get 50 cents per ton, when the firm pays all helpers, giving the bar rollers \$4.50 per day. Sheet rollers get paid different prices per ton for different gauges of the iron. The most frequent gauges are Nos. 22 to 24, for which \$7.13 is paid per ton; two tons of these gauges are a day's work, or \$14.26 per day, of this the roller has to give to the heater

one-fourth, \$3.56; to the shearer, one-fifth, \$2.85, and to his catcher \$1.50, leaving the sheet roller per day \$6.35. The shearer trims the work of two rollers, making his wages \$5.70 per day.

The Operation of the New German Patent Law.

To the Editor of *The Iron Age*: The new German Patent Law of May 25th, 1877, having been in operation since July 1st last year, it will no doubt be of general interest to have some statistics regarding the business transacted by the German Patent Office during the first year of its existence, ending June 30th, 1878. During this time the total number of communications entered on the journal amounted to 18,867—7169 during the half year 1877, 5134 during the first and 6564 during the second quarter of 1878. Of these 6336 were applications for letters patent. These applications were filed as follows:

1452	in the third quarter of 1877.
1360	" fourth " 1877.
1601	" first " 1878.
1523	" second " 1878.

Up to the 30th of June provisional protection was allowed to 4016 of these said 6336 applications, the greater part of the remaining 2320 cases was still under examination, and the balance had been refused. During the last quarter, from April to June, 1878, 6564 numbers were entered in the patent journal. Among these were 1523 applications for letters patent, 192 applications contesting the grant of letters patent for inventions provisionally protected, 141 appeals against decisions rendered by the Patent Office, 10 applications for annulment of patents granted, 4315 letters of correspondence and additional applications, 383 minor items, petitions for situations, &c. The first patent was granted on November 29th, 1877, and from that day up to date 2806 letters patent have been issued.

These figures prove that the young German Patent Office is second in the list of the patent offices of the world in regard to the number of applications filed, its only superior in this respect being the United States Patent Office. Before the creation of the German patent law, France with about 4500, and Great Britain with about 4000 applications came next to the United States. Now, even in her first year, Germany has left them far behind, and the number of her applications is still on the increase, as will be seen from the statistics given above. The proportion of patents granted to applications filed is greater in Germany than it is even in the United States, where about 30 per cent. of all applications filed are refused.

Among the above number of applications a great many have been filed by American inventors. I cannot help again drawing their attention to the clause of the German patent law which I referred to in my letter to *The Iron Age* of February 14, 1878, page 15. Paragraph 2 states that an invention has lost its novelty if it has appeared in print before the application for a German patent is filed. If an American inventor has taken the United States patent first, he must take care that his patent is not issued before he has duly filed his application in Germany. Many of the applications filed by American inventors have been patented, and were published in the United States before such applications were handed over to the Berlin patent office. Some of them were refused by the office at once, the respective examiner being aware of the fact of their publication, for others provisional protection was allowed, but letters patent therefor had to be refused because they were contested by parties interested who had obtained knowledge of the fact that the respective cases had been patented and published in the United States before. To the remainder definite letters patent were granted. Yet letters patent granted under the circumstances stated are like houses built on sand. They must be annulled if it can be proved that they were issued and published in the United States but one single day before the application was filed in Berlin. More than nine-tenths of all the German patents held by American patentees are worthless, because the inventions were published by the *Official Gazette* prior to the date of the German application. Perhaps part of such patentees will nevertheless do a good business with their patents, but they must never forget that they may any moment lose their right.

The German patent office is most liberal toward inventors, and rather takes the inventor's part than that of the contesting party, but the patent office can do nothing for the inventor in cases like the above, where the prescriptions of the law are so very precise and clear. This clause in the German law, which is contained in the French law likewise, will, there can be no doubt, prove to be more or less a drawback in the free development of protection which the government has intended to bestow upon all inventors without difference as to nationality. It is to be hoped that the resolutions proposed by Mr. Othmar Lenz in the name of the Society of German Patent Attorneys will be passed by the patent congress now held in Paris, and that they will induce our legislature to pass some amendment in reference to the above-mentioned clause.

I most sincerely wish that American inventors should enjoy the benefit of the German patent law, which, indeed, is in most respects a very good and efficient one, and which is enforced by the patent office with the utmost liberality toward inventors. If inventors and their attorneys will pay attention to the facts given above, they may easily obtain their German patents and keep them valid without any danger of injuring their United States patent right, as the publication of letters patent in the United States may be easily deferred after they have been granted until the German application is lodged. Very respectfully,

ROBERT R. SCHMIDT.
BERLIN, August 29, 1878.

A society has been formed in Edinburgh for inspecting the sanitary condition of dwellings. The evils of bad air, stagnant moisture, and defective sewers have so unmistakably declared themselves in pre-

vailing sickness and excessive mortality tables that householders have associated themselves together to employ an expert, each paying \$5 a year.

St. Louis Safe from Yellow Fever.

We have received a copy of the following circular:

ST. LOUIS, September 2, 1878.
DEAR SIR: In reply to numerous letters and inquiries daily received, we attach hereto a circular recently issued by a large number of our wealthiest and most reliable wholesale firms, and confidently assure you that the statement made therein can be unhesitatingly relied upon in every particular, and that you can visit this city as safely as you ever could. We feel perfectly justified in saying that there have not been over a dozen deaths in this city from yellow fever, and in every one of those cases the disease was contracted in some Southern city and before the person arrived here, and their system too much reduced to recover.

Respectfully yours,
EXCELSIOR MANUFACTURING COMPANY.

ST. LOUIS, August 24, 1878.
DEAR SIR: It has come to our knowledge that false reports have been circulated throughout the country concerning the presence of yellow fever in this city. There are no cases of yellow fever here. This city was never in a healthier condition than now, and we desire in this manner, over our own signatures, to remove any false impressions which may exist by reason of such reports. The yellow fever has never been epidemic in St. Louis, nor will it ever be so. There are many reasons for this statement which would require too long a circular to explain. We simply state it as a fact for your information.

Like New York, Philadelphia and other cities in this latitude, there may have been isolated cases brought here from the South, which were contracted there, and which may or may not have resulted fatally; but the disease is not now, nor has it ever been, either epidemic or even contagious here, and you can visit this city with as much safety as any other in the country.

Very respectfully yours,
Crow, Hargadine & Co., Chase & Cabot,
J. H. Wear, Boogher & Co., W. H. Kellogg & Co.,
Samuel C. Davis & Co., H. T. Simon & Morse,
Clifton, Allen & Co.,
A. Frank & Sons, Missouri Glass Co.,
Dodd, Brown & Co., Sahlin, Singer & Co.,
Appleton, Noyes & Maude, Westermann & Meier,
Tennent, Walker & Co., Bradford, Bro. & Co.,
Chas. R. Lewis & Co., Gray, Kimbrough & Co.,
J. Meyberg & Co., A. F. Shapleigh & Co.,
Gauss, Hunnicke & Co., J. Kennard & Sons,
Simmons Hardware Co., A. Frankenthal & Bro.

Opening Europe to the American Leather Trade.

A reporter of *The Iron Age* recently interviewed one or two of the leading men in the "Swamp," where the leather trade of New York is concentrated, to inquire concerning the progress making in opening a foreign market. A dealer who has close relations with English factors, expresses surprise that public attention has not been directed more particularly to the magnitude of this business and the rapidity of its growth.

An export movement amounting to nearly \$5,000,000 per annum from the port of New York alone, has sprung from nothing within eight or ten years, and seems capable of indefinite expansion. New York is the head center of the export trade, though Philadelphia, Boston and Baltimore all have a share. The grand point gained thus far is a strong foothold in Great Britain and throughout Continental Europe, so that there is now a steady demand abroad for American leather. Hamburg, Bremen, Trieste, and in the North of Europe, Christiania, Stockholm, Riga—all these have become large buyers in our market, either direct or through agents, paying in cash. Shipments hence to Liverpool and London go largely on consignment on the open market or a guaranteed price. There has been a steady increase in the trade from a few thousand sides prior to 1868 up to, say, 1,225,000 in 1878, each side valued at from \$3 to \$5, according to weight and quality.

The excellence of the American methods of tanning is everywhere acknowledged. Of all English tanned leather only a small percentage is made with bark, chemicals of various sorts and other materials such as can be had having been substituted. Among these are valonia, divy-divy, &c., all of which have certain tanning qualities. Formerly in England there was great prejudice against hemlock on account of the red color given, but to-day good hemlock is superseding cheap English tanned. We are able to furnish bark-tanned leather at a little lower price than the common grades of English tanned, and thus meet the wants of a large class of consumers.

When we come to the Continental trade American tanners have an advantage in this respect, that from a given number of dry hides we can turn out a larger percentage of finished leather than the local manufacturers. The Germans, for example, from 100 pounds will make from 130 to 140, while the Americans will produce from an equal quantity no less than 165 to 180 pounds, showing a difference of 65 to 80 per cent. in favor of the latter, all owing to the abundance and cheapness of American bark as compared with the tanning materials available to the foreign manufacturer. Assuming that the cost of labor is the same in either case, the Germans must pay two or three times as much for the materials used in tanning.

Directing our attention next to Sweden and Norway, we find that tanners in that part of Europe have been almost driven out of business by American competition. Tanners there who formerly tanned from 15,000 to 20,000 hides per annum have reduced their production to a nominal amount, or abandoned their vocation entirely, to deal in leather from the United States. A gentleman from Christiania who was recently in New York City frankly admitted that they could not compete. As for more distant markets, we are making good progress in sending leather to Northern Italy, Austria and South-eastern Europe, and our product finds its way down into Turkey. Trieste is becoming quite a port, as we are getting a direct trade there which formerly went to London or Hamburg. The export from Canada makes quite an item in the leather trade, and is in competi-

tion with leather from the States, but is not of so high a grade.

The effects of exporting live cattle are scarcely perceptible as concerns the leather trade, though it is obvious that thousands of hides disappear in this way, taken from our very best cattle in the West and lost to this market. Just here is found a disturbing element which must be developed in due time.

In accounting for the growth of the export movement and the steady foreign demand now established, we look at its beginnings. The war greatly stimulated the production of leather, and at its close so many tanneries had been built that we found a surplus in the market. Large quantities were sent away on consignment at a loss to the producers. Nevertheless this forced alternative had the effect to open a market. Foreigners became acquainted with our goods and prejudice was removed. Eventually substantial benefits will be realized.

Undoubtedly there have been great improvements in tanning, from which the trade has profited. "English bend leather," known all over the world, is in no respect better than we can produce. At first English people had a strong prejudice against our manner of cutting up hides by splitting them down the back, but with the introduction of machinery they find this process is free from objection, and now England probably takes 500,000 or 600,000 sides per annum. On the Continent great changes have come about within two or three years, in consequence of the introduction of shoe-making machinery, such as sewing, cutting and pegging machines, doing away with hand labor. All sorts of shoes are now made in the same establishment, so that every part of a side of leather can be utilized with the best economic results.

In review of the general subject it appears that all parts of Europe are opening to the American leather trade, France alone excepted. Duties there are prohibitory, but with a reciprocity treaty, which is now considered possible, it is believed by American leather dealers we would export heavily. We are already making large shipments to England and the Continent of finished upper leather, called "pebbled grain," "buff splits" leather, &c.

Commercial Law Decisions.

Common Carriers.—Common carriers are not bound to provide against improbable contingencies with the same vigilance that they would when danger is anticipated.—*Pennsylvania Railroad Company vs. Fries, Sup. Ct., Penn.*

Indorsement.—Where a person's name appears on the back of a note, and is signed before delivery, the presumption is that he is a guarantor and not a maker.—*Hamilton vs. Johnston, Sup. Ct., Ill.*

Consideration.—Part payment of a debt already due is not sufficient consideration for an agreement to extend the time for the payment of the residue.—*Turnbull vs. Brock, Sup. Ct., Ohio.*

Bankrupt's Composition.—A court will interfere when the debtor has deceived the creditors into a vote which they would not have given had the facts been honestly and fairly before them. It will withhold its assent to a composition if it is satisfied that the proceedings are not collusive.—*In re Keller, bankrupt, Dist. Ct. S. D., Ill.*

Payment.—When various debts were intermingled in one account, for which notes were given from time to time in part payment, and when payments were made from time to time which were not directed to be applied specifically, but were credited generally; held that the application of such payments upon the earliest items of the account was proper.—*Jackson vs. Johnson, New York Ct. of App.*

Promissory Notes.—If a party takes a negotiable bill or note before maturity for good consideration and without fraudulent purpose, he acquires a good title thereto, although he may have been negligent. Gross negligence, while it may be evidence of bad faith, will not alone be sufficient to defeat the title. Nothing less than proof of knowledge of facts that show the want of authority on the part of the person transferring the note will be sufficient for that purpose.—*Citizens' National Bank vs. Hooper, Sup. Ct., Md.*

Ohio Coke.—For some time past, Sarah Furnace, Ironton, Ohio, has been making good iron with native ore, one-half Sheridan coal and one-half Connellsville coke. A trial is soon to be made to see what combination Sheridan coke will require for successful metal production. The Sheridan Company have been busy for some days past making coke for this experiment, and have now drawn out about 12,000 bushels. It is the object to get about 20,000 bushels on hand before the trial is made. The coal is coked in pits just as charcoal is made, and it takes about seven days to burn a pit. It is not anticipated that the coke alone will furnish proper fuel for smelting purposes, as it will be too soft to hold up the burden, but used in combination with Connellsville coke it will, it is thought, work nicely and make quite a saving, but this depends, of course, on the quantity that can be utilized in combination.

Discovery of Copper Deposits in Pennsylvania.—Reports of the discovery of some very rich deposits of copper come to us from near Waynesboro, Franklin county, Pa. Some specimens of the surface rock have been examined by a Washington chemist, who states it to be "hydrous carbonate of copper or malachite, a very rich ore of copper containing about 72 per cent. of oxide of copper or 57 1/2 per cent. of metallic copper." Since this analysis some new mines, known in the region as the Dr. Snively mines, have been opened, from which pieces of native copper resembling the Lake Superior copper are reported to have been taken. The specimens contain 70 to 95 per cent. of metallic copper. One of these pieces is on exhibition at Harrisburg which weighs over 22 pounds. Dr. Isaac N. Snively writes us: "I am satisfied that there will be rich and startling developments in this mineral region from the present indications."

AMERICAN SCREW CO.,

Providence, R. I.,

MANUFACTURERS OF MORE THAN 4000 VARIETIES OF PRODUCT,

AND INCREASING THE ASSORTMENT DAILY.

Machinery employed contains important inventions recently patented, and which are designed to produce Screws at a **lower cost to the consumer** than has ever been attained.

All goods are distributed through the Hardware trade, to whom a liberal discount will be allowed.

INTERNATIONAL EXHIBITION. PHILADELPHIA, 1876.

(No. 235.)

The United States Centennial Commission has examined the report of the Judges, and accepted the following reasons, and decreed an award in conformity therewith.

PHILADELPHIA, November 8, 1876.

REPORT ON AWARDS.

Product: Iron, Brass and Steel Screws, Tire and Stove Bolts, Rivets.

Name and address of Exhibitor: American Screw Company, Providence, R. I.

The undersigned having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for Award, for the following reasons, viz: **Being of a quality nearly approaching perfection, showing the highest attainment in this branch of manufacture.**

G. L. REED, Signature of the Judge.

Approval of Group Judges.

Daniel Steinmetz,
Jas. Bain,
Chas. Staples,

G. L. Reed,
J. D. Imboden,

J. Diffenbach,
Dav. McHardy.

A true copy of the record.
Given by authority of the United States

FRANCIS A. WALKER, Chief of the Bureau of Awards.
Centennial Commission.

A. T. GOSHORN, Director-General.

[L.S.] J. L. CAMPBELL, Secretary.

J. R. HAWLEY, President.



After forty years' experience we offer to the trade our Centennial Screws, patented May 30, 1876, as the best we have ever known.

The method of manufacturing is also patented, and we are changing our machinery as fast as possible, to manufacture the improved article only. To introduce them, they will be sold at the same price as the old style screw.

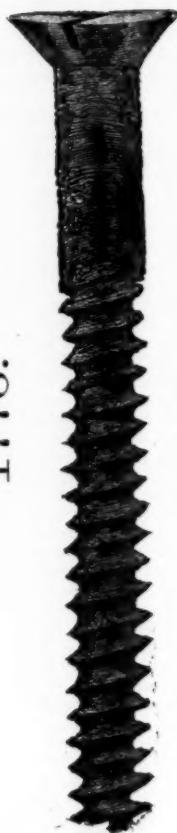
The new screws will be packed in manila colored boxes with the new label covering end of box, and enlarged figures showing plainly contents.

To distinguish this screw we have adopted a trade-mark, which is also secured to us.

The accompanying engravings show the progress of making screw from the old blunt point to style now adopted.

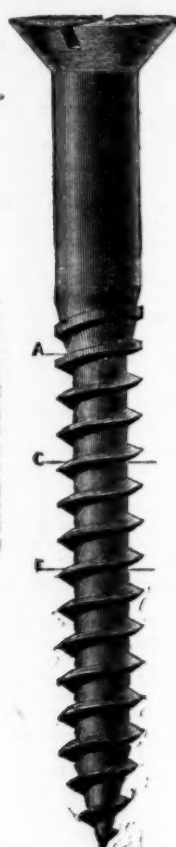
Experience has shown that the weak point of screws, as formerly made, is at the heel of the thread, where all

1776.



1846.

Patented August 30.



Section at Line A B

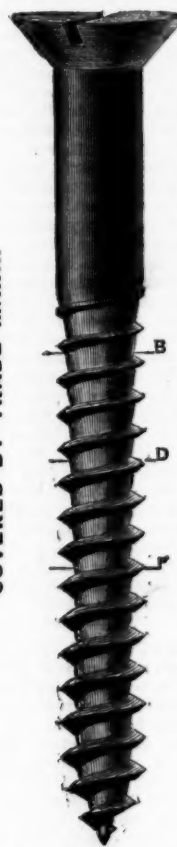
Section at Line C D

Section at Line E F

1876.

Patented May 30.

COVERED BY TRADE MARK.



Section at Line A

Section at Line C D

Section at Line E F

Estimated to be FIFTY PER CENT. stronger than a Screw as Commonly made.

the strains of forcing the screw into the wood naturally concentrate.

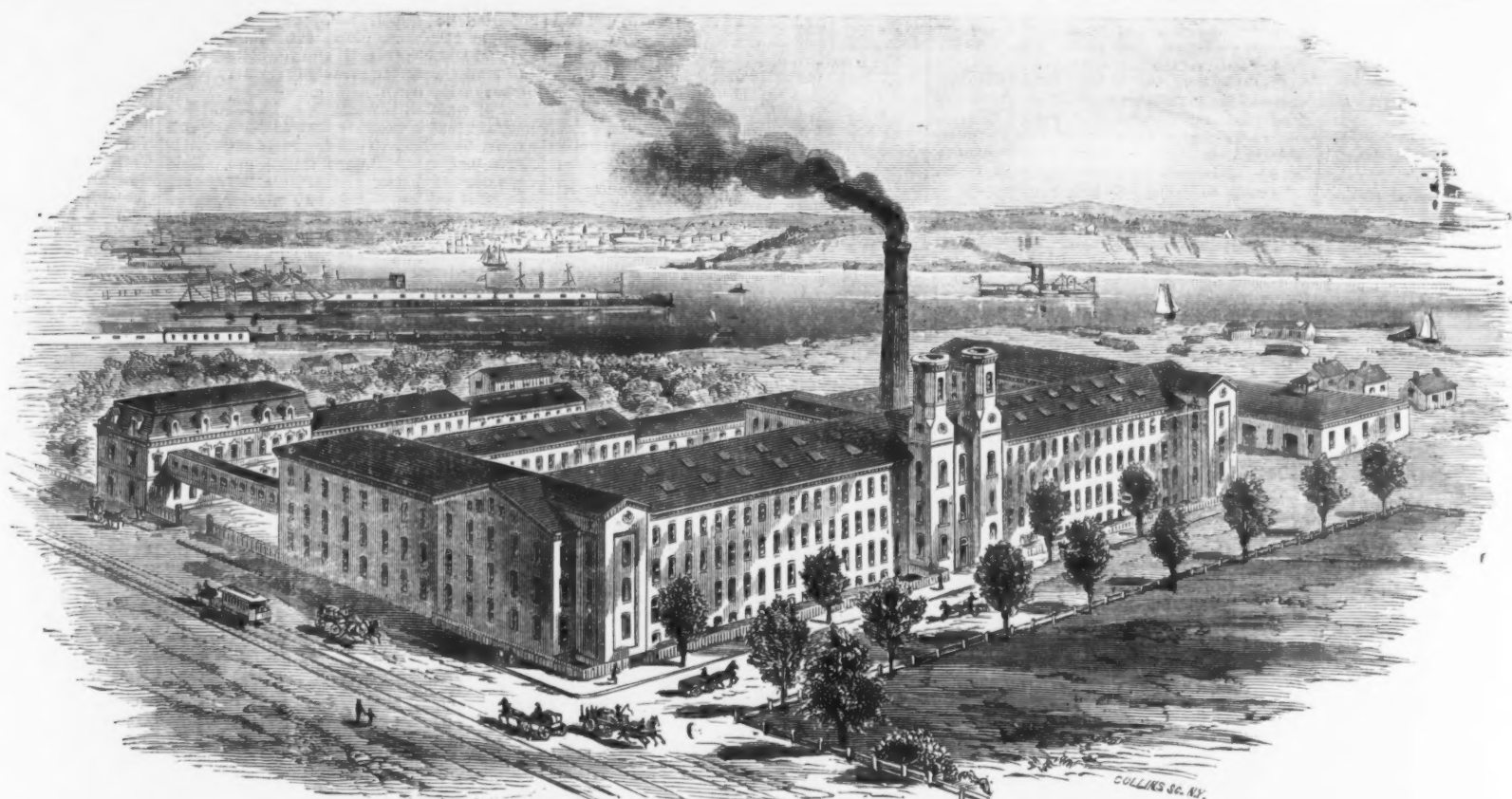
To avoid the sharp angle existing in the old style of screws has been the aim of all manufacturers, but every expedient hitherto adopted has proved as objectionable as the evil complained of.

It will be seen in our new screw that not only is the sharp angle avoided, but the strength very much increased, as illustrated. See sections at lines.

CLAIM.

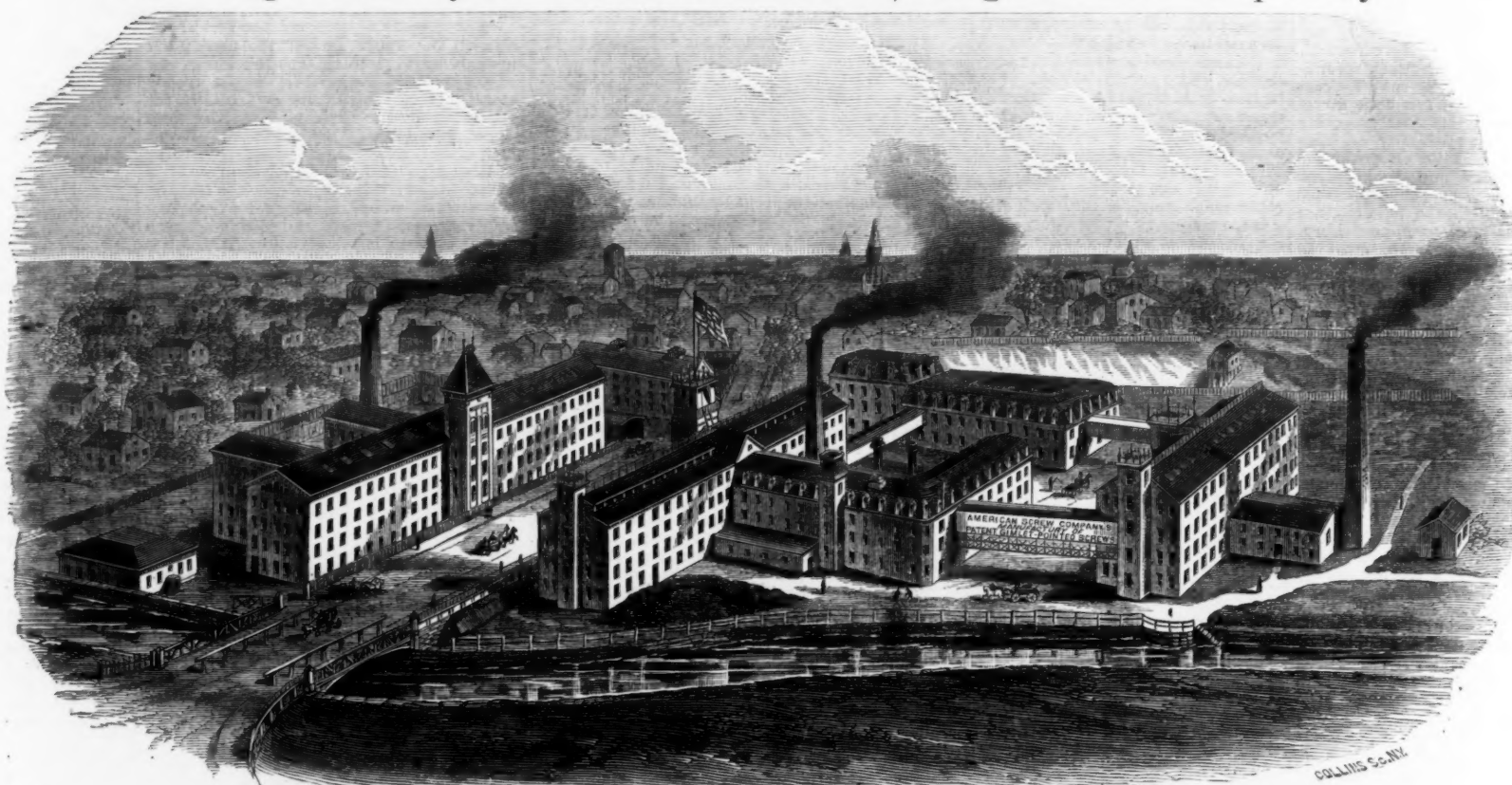
"A Pointed Wood Screw having the outer periphery of the thread upon its body cylindrical, while a portion of the body below the thread and near the neck is conical, the remainder of the body to the point being cylindrical, and yet having all the thread brought to an edge of a constant angle, without jogs in the paths between the threads, substantially as described."

On the opposite page will be found illustrations of the various Works of the company.



NEW ENGLAND MILL.

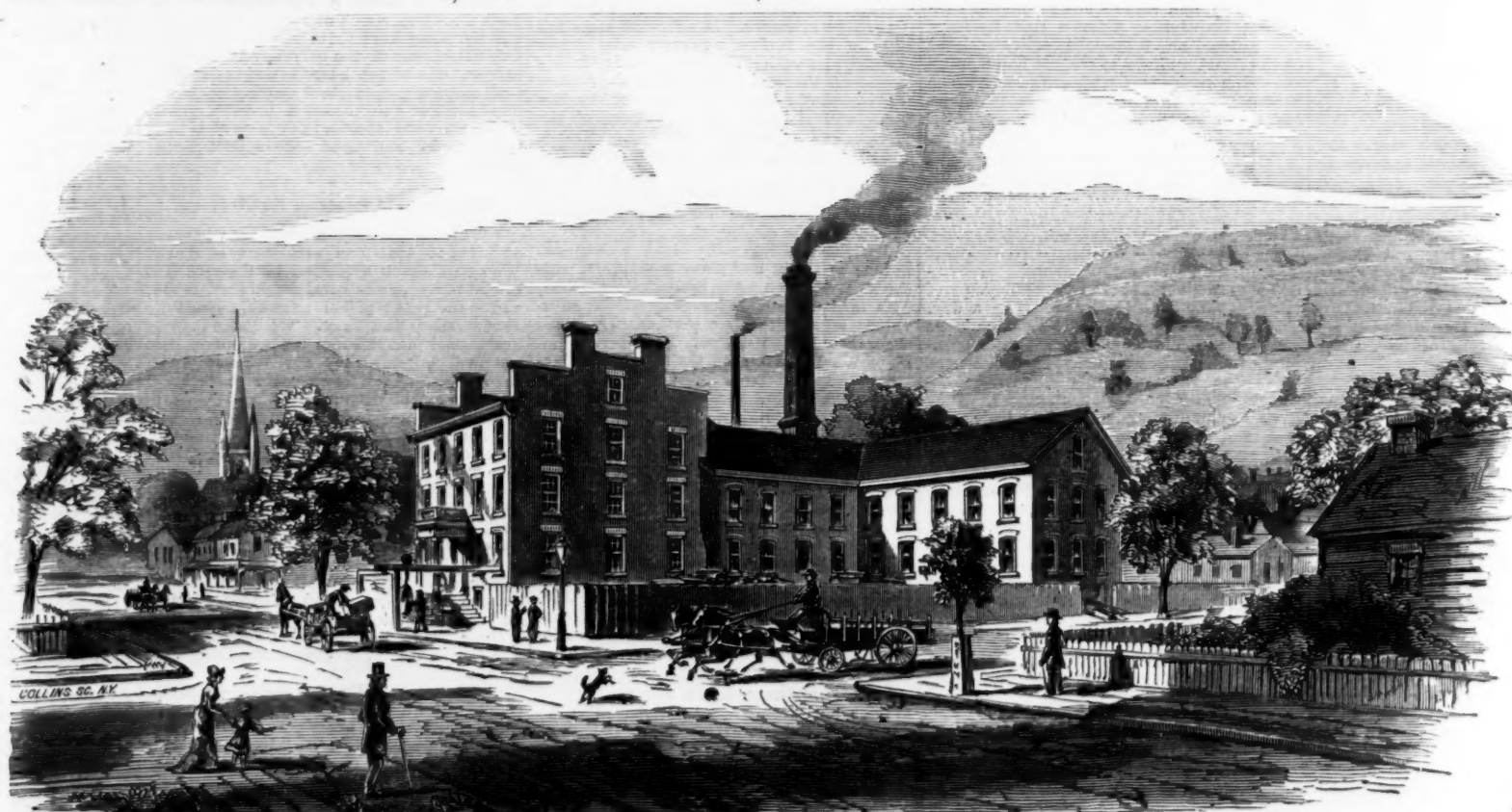
Containing Machinery for the Production of 22,500 gross of Screws per day.



BAY STATE AND EAGLE MILLS.

BAY STATE MILL,
For the Production of Stove Bolts, Tire Bolts, Rivets,
Lock and Machine Screws, &c.

EAGLE MILLS.
Capacity 22,500 gross Wood Screws per day.



WORKS AT DUNDAS, ONTARIO, CANADA.

Capacity, 4000 gross Screws per day.

THE PARIS EXPOSITION.

(From our Special Correspondents.)

PARIS, August 27, 1878.
AUSTRIA.

Although Austria and Hungary form but one government, each country has a separate section for its exhibits, each has its own commission and each has published its own catalogue. There is a marked difference between the products of the two countries. In the Austrian department a prominent place is held by machinery of all sorts, while in Hungary the mining industries and the production of raw material occupy the foremost rank.

A fine exhibit of cast-steel files is made by J. Braun's Söhne, of Schöndorf, who have also a display of steel armor plates. The Emperor Ferdinand and Moravia and Silesia Railway Company exhibit some boilers made of Austrian Bessemer steel plates.

A Collman has a steam engine with his valve gear; also drawings, models and descriptions of the Collman gear. The steam admission valves are operated by means of two motions, one of which is constant while the other is variable. The opening and closing of the valves, therefore, vary according to the variation of the changeable motion. The claims made for the Collman gear are: 1. The valve is never allowed to drop, but is always quickly raised and quickly lowered by the gear against the power for closing the valve, which is much larger than necessary and only provides a rigid connection between the gear and the valve while the latter is open. 2. This gear enables the valve to close with the highest speed durability permits. 3. So little resistance is opposed to the action of the governor that during every stroke of the engine full pressure of steam is supplied to the cylinders in exact proportion to the work done. 4. These improved gears offer excessively large surfaces against wear and tear. 5. Engines provided with this gear can be arranged to make up to 100 revolutions per minute without causing any inconvenience. 6. The security of action, combined with the quality of being reversible and giving all degrees of cut-off (from 1-100 to 9-10 of the stroke) for both directions of rotation, make this gear especially suitable for marine and winding engines.

Jeanrenaud & Co. have on exhibition some paper, pasteboard and bookbinders' machinery; also a small hydraulic press for use in laboratories and in the manufacture of chemical products, of soap, perfume, rubber, chocolate, oils, essences, &c. L. Nemelka, of Simmering, near Vienna, has a large exhibit of grain-mill machinery. An interesting exhibit is that made by the Society of Pneumatic Clocks of Vienna. A central regulator transmits pulsations of compressed air to any number of local time-keepers, which, it is claimed, may be placed as far as 3500 meters (over two miles) from the regulator. A cylinder, a piston, a pallet, and a system of gearing which transmits motion to the hands, is all the mechanism required for the local clocks. Some twenty or thirty of these clocks are in operation in the machine gallery, their connection with the regulator being made through coils of lead pipe of various lengths. The pulsations follow each other at intervals of one minute, all the hands moving exactly together.

Passing by some machines for filling seltzer water syphons, exhibited by Charles Pochtler of Vienna; pneumatic tubes for sending dispatches, and various telegraphic apparatuses, we come to Eibiswald & Krumbach who have a collection of locomotive and car springs, some saws, and a large number of specimens of various grades of cement and crucible steels, some of which contain wolfram and manganese. Franz Wertheim & Co., of Vienna, make an important display of carpenter's tools. They have also a number of fire-proof and burglar-proof safes. Another exhibit of tools is made by John Weiss & Son. Here we find wood-working, printers', bookbinders', and other tools.

E. Skoda has a continuous press for beet slices after they have been treated by the diffusion process. The press is composed of two eccentric cylinders, one of which is placed inside of the other. These revolve in the same direction with the same speed at the periphery, thus subjecting the beets to pressure instead of tearing them. It is stated that one of these presses will treat from 150,000 to 175,000 kilograms of beets in 24 hours. After pressure the weight is reduced from 40 to 45 per cent. Mr. Skoda also exhibits a horizontal condensing engine with patent automatic expansion valve arrangement. This arrangement consists of two slide valves, the principal one being a Mayer expansion valve. A small steam cylinder and piston transmit motion to the other valve, and the expansion is automatically regulated by air buffers and catches similar to those employed in the Corliss engine. A large rotative diffusion apparatus for the manufacture of beet sugar is exhibited by the Prager Maschinenbau Gesellschaft.

L. Becker has a self-acting brake, whose action depends on the friction of the car wheels with a surface which is thus caused to revolve, shortening chains which put on the brakes. Mahler & Eschenbacher, of Vienna, show a number of Schram & Mahler rock drills and a collection of miners' tools. Austrian agricultural and mill machinery is represented by the exhibits of Hoerde & Co., of Vienna, and Julius Carow and Umrath & Co., of Prague. Here we find various roller mills, centrifugal flour dressing machines, thrashing machines and grinding and grain splitting machines. Further on are a passenger car with first and second-class compartments, a railroad car for postal service exhibited by F. Ringhofer, and a freight locomotive constructed by the Wiener Locomotivfabrika-Gesellschaft. Alexander Askensky exhibits his deflectometer. This is a simple apparatus for graphically recording the curve of deflection of iron bridges during the passage of a railroad train.

HUNGARY.

The mining industries of Hungary were one of its chief resources even in the middle

ages. Several centuries ago the production of the precious metals amounted to 4,000,000 or 5,000,000 florins per annum, and has remained stationary ever since. The iron industry is being steadily developed. The production has varied of late years between 100,000 and 160,000 tons. The amount of coal produced is about 1,600,000 tons. Copper and nickel are also found to a considerable extent. It is therefore not astonishing to find Hungary comparatively well represented in all that pertains to the mining industries.

The workshops of the Hungarian State Railroads exhibit a horizontal 80-horse-power condensing engine, with variable cut-off, and a 10-horse-power portable engine. Also a large log-sawing machine, some drawings of iron bridges, plans of the State saw mills at Besztercebánya, and of the railroad shops. Ganz & Co., of Buda-Pesth, have some chilled car wheels which were withdrawn from use only a few weeks before the opening of the Exposition. Two of these wheels (No. 423 and No. 569) were cast in 1855. It is claimed that the former has traveled 72,345 miles. They are cast from Hungarian pig, and are covered with a hard, white crust about 3/4 inch thick, which gradually deepens in color until it reaches the dark gray of the body of the casting. This company also exhibit some of their chilled railway crossings, a number of projectiles also made of chilled cast iron, and some compressing grain mills whose peculiarity is that instead of grinding the grain they merely crush it by means of two cast-iron rollers. E. Meyer has a velocimeter for measuring the rapidity of a current of water. It consists essentially of a screw which the current causes to revolve. The number of revolutions is read off from a dial.

A number of handsome models of side-wheel steamboats for the navigation of the Danube are exhibited by the naval yards of Buda-Pesth. Janos Fekete-hazy has sent the plans, model and estimates of a projected bridge over the Danube between Buda and Pesth. Considerable space is taken up by the exhibit of the Minister of Public Works and the Municipality of Buda-Pesth. This exhibit is composed chiefly of maps and printed documents.

Two models of boats for the navigation of shallow, rocky or crooked streams are exhibited by A. Gyürki. The propelling apparatus consists of paddles revolving about vertical axes. These paddles can be rapidly made to propel the vessel in any direction. The rudder is, therefore, dispensed with. Mr. Gyürki also exhibits a centrifugal apparatus which may be employed either as a water pump or as a ventilator. The inventor claims that with a velocity of 3.50 meters to 6 meters per second his apparatus will drive a current of air or gas against a pressure of two meters of water.

The Hungary and Buda-Pesth Railway has a locomotive, and Frederick Seitenhofer a small steam fire engine. The administration of the royal mines of Székácska have sent some wire ropes and some plans, photographs and models of an air compressor, a perforator invented by Messrs. Richter & Brossman, an instrument for determining the hardness of rocks and some mechanical ore dressers.

One of the largest exhibits in the Hungarian section is made by the Austrian State Railways. Their products are entered in ten different classes in the Hungarian department and in two classes in the Austrian section. The company possess: 1. A metallurgical plant at Resicza, consisting of three blast furnaces, four Bessemer converters, two Martin furnaces and shops provided with all the machinery necessary for the construction of all kinds of machines. 2. A metallurgical plant at Anina, composed of two blast furnaces, a Pernot furnace and an important foundry. 3. Blast furnaces at Bogdan and Dognácska. 4. Copper, lead and silver works at Dognácska, Szászka and Csiklova. 5. Works at Steierdorf for the distillation of schists, and a factory at Oravica for the manufacture of paraffine and mineral oils. 6. Sulphuric acid and sulphate of copper works at Moldova. 7. Brick works, lime kilns and a cement factory at Oravica and Bogdan. 8. Saw mills at Franzdorf and Csiklova. The mines owned by this company are: The coal mines of Steierdorf, Doman and Szekul, the magnetic hematite iron mines of Moravica and Dognácska, and various other mines at Oravica, Dognácska, Szászka and Moldova. One hundred and fifty-eight boilers are used in the shops, and the aggregate power of all the steam engines is 6555 horse power. The production of the various mines, foundries and works for 1876 was, tons:

Coal.....	243,864
Iron ore.....	63,825
Pig iron.....	31,446
Steel ingots.....	23,054
Iron and steel castings.....	5,815
Wrought iron and steel.....	39,864
Various products, such as copper, lead, silver, cement, lime, paraffine, mineral oils, sulphuric acid, &c.....	15,498

The Austrian State railways employ over 12,000 men, women and children. The wages of the men vary from 36 cents to \$1.09 a day. The average wages paid to the women is 20 cents and to children 16 cents a day. The exhibit of this company consists of specimens of its various products and plans, drawings, descriptions and models of its works. They have a small mining locomotive about 27 1/2-inch gauge, weighing 6800 pounds, which they claim has transported 108,198 tons of coal through a gallery 2457 meters long in 547 days of 10 hours, with a total expenditure of 4357 florins (\$1973.72). The work done was, therefore, 486 tons a day per kilometer, and the expense of transportation was 1.6 kreuzers (8 mills) per kilometer ton.

An important collection of ores and minerals is the collective exhibit of the Hungarian Geological Society. This society also exhibit geological charts and graphical representations of the comparative production of the Hungarian mines for the last twenty years.

Notes.

PARIS, Sept. 6, 1878.

The first meeting of the International Congress for the unification of weights, measures and coins, was held on Sept. 2 at one of the small halls of the Trocadéro.

The National says that M. Teisserenc de Bort, Minister of Commerce and Agriculture, has announced to the members of the

Superior Commission the intention of the government to prolong the Exposition 20 days, and to allow the exhibitors to sell and deliver their goods during the last 10 days.

The International Congress on patents and trade-marks held its first meeting on Sept. 5 at the Palace of the Trocadéro. Among those present were the Minister of Agriculture and Commerce; M. de Chlumetzky, Austrian Minister of Commerce and Public Works; MM. Bozérian, Senator and President of the Congress; Messrs. Levasseur, Ch. Thirion, Pelicot, Tresca, Foucher de Careil, Cordier, de Douhet, Hérol, Pascal Duprat, Gévelot, Tirard, Barbedienne, Christofle, Poirrier, Rondelet, Froment Meurice, Houette, Duplan and a number of foreign manufacturers and business men who attend the congress as delegates. M. Teisserenc de Bort opened the meeting with a speech, in which he set forth the object of the congress. He said the government took a special interest in the congress because it hoped to be enlightened by the manufacturers as to the best measures to take in order to protect every inventor in all civilized countries. MM. Bozérian, Ch. Thirion and M. Maillard de Marlay then spoke. M. de Marlay's conclusions were: The union of all nations for uniform legislation on this subject, and the recognition in all countries of a trade-mark deposited in any one of them. The congress will last 11 days.

Some of the Paris papers say it has been decided that in cases where several awards have been made to one firm, the highest prize awarded will alone be given.

The 21st of October had been determined upon as the date for the distribution of the awards; it is now stated that the ceremony will take place toward the end of September. A great deal of discontentment is expressed by the exhibitors at the delay there has been in publishing the official list of awards. In 1867 the names of the successful exhibitors were inserted in the *Journal Officiel* as early as July. The reason of the general dissatisfaction is that until the official list is made public no exhibitor is authorized to advertise that he has been rewarded.

An official lottery has been organized by the French government. The object of this lottery is, first, to encourage the exhibitors who have contributed to the success of the exposition by facilitating the sale of the objects exhibited, and, secondly, to create a special fund which will be employed in defraying the expenses of a visit to the Exposition for citizens of the provinces who have not the means to come and who would be most likely to profit by such a visit. Two-thirds of the receipts will be employed in buying prizes, and the rest will go to make up this fund. A considerable number of exhibitors have made valuable gifts to the committee appointed to buy the prizes. The price of the tickets is one franc. The drawing will take place probably on the 20th of October.

American Agricultural Exhibits.

GUY C. HOTCHKISS, FIELD & CO.,

New York, make in the Agricultural Annex the finest display of our American woods for wheels, ax handles, &c., that there is in the Exhibition. It includes not only the woods themselves, such as elm, ash, hickory, oak, &c., but the products, including spokes, hubs, rims and ax handles, hoe, rake, shovel, fork and other handles. Among the pieces of wood is one 4 inches square that is absolutely bent so that the sides are parallel without breaking all the fibers. The exhibits of this class of goods attracted a good deal of attention. Our handles have been exported in large quantities for some time, and the prospect is that as a result of our exhibit at Paris our wheels will soon form a considerable article of export.

THE GALE MANUFACTURING COMPANY,

of Albion, Mich., exhibit two beautifully finished chilled plows. It is claimed that chilled iron, from its hardness and the very high polish of which it is susceptible, has unsurpassed scouring qualities. The handles and beam are so attached that they are readily adjustable to any height required. There is also an adjustable center draft beam, so placed as to bring the power squarely against the resistance of the furrow, which gives the plow steadiness in running and ease of management. The jointer attachment to this plow is claimed to possess great merits. It turns off from the edge of the furrow a narrow slice of the surface, and with it the grass, weeds, stubble or manure thereon, so that when the furrow is inverted the lap is entirely of mellow earth, with the trash in the bottom of the furrow and completely covered. This is attached to the standard instead of the beam.

DEERE & CO.,

Moline, Ill., make a very fine display of plows. In the center of the exhibit, on a pedestal, is a Gilpin sulky plow, ornamented in blue and gold and silver mountings, with the steel and iron parts beautifully polished. This is surrounded with gang plows, cultivators and nine other plows. They also show their Moline wagon. The Deere & Co. Plow Works is one of the oldest manufacturing establishments in the West. John Deere, the senior member of the original firm, and the president of the present company, commenced the manufacture of steel plows in 1837, in Grand Detour (Lee county, Ill.), where he carried on the business until 1847, when he moved to Moline and laid the foundation of the present establishment. The works occupy 219,366 square feet of room for working purposes. With a force of 600 men, the works have a capacity of 500 finished steel plows, sulky and gang plows and cultivators every working day. About 3500 tons of steel and iron are consumed annually. The works are run by water equal to 300-horse power, and a steam engine of 150-horse power.

ALEXANDER SPEER & SONS, of the Globe Plow Works, Pittsburgh, make a very fine exhibit of plows of their own manufacture. This house has been engaged in the manufacture of plows for upward of half a century, and their plows have an extensive sale not only in the United States but abroad. Since the Centennial their foreign trade has rapidly increased, and their line of plows now include a large number of articles especially adapted to foreign mar-

kets. Among the plows exhibited we noticed their No. 10, new series, steel plow, patented in September, 1877. This is a medium two-horse plow, suitable for both sod and stubble ground, and for both smooth and stony land. It turns a furrow 12 to 14 inches wide by 6 to 8 inches deep. The steel of which it is made is so hard and fine in grain that it polishes like a mirror, and cannot be drilled or filed. It is impossible to roughen it any more than glass. Rust does not eat into it, and after a heavy coat of rust it will repolish in two minutes, in the ground, as bright as silver. It is of uniform hardness. The longer it is used the finer the polish becomes. The shares are made of the best German steel and last much longer than common chilled shares. They make a smaller size, No. 9, right and left. They also show their reversible hillside or level land plow. It has two steel moldboards and two cast points, with wrought-iron beam and handles, with or without steel points, as ordered. To reverse the plow the clamp is thrown off the standard with the rod running back along the handle. Starting into the ground adjusts the moldboards; this saves all handling of the plow. It works as well on level land as sidehill, and saves all dead furrows. They also show their Lone Star steel cotton plow. These plows are adapted expressly for black, waxy prairie lands. They are made with wrought-iron standards and frame; the landside being movable, is bolted to a wrought-iron bar, running back the entire length. They also exhibit their iron expanding cultivator, and a very valuable machine, a potato digger. This potato digger has been thoroughly tested the past seven years, having been first introduced in the fall of 1869, and since that time has undergone many valuable improvements. It is operated by one person and two horses, draws light, and is easily managed, with a capacity to dig as fast as 10 men can pick the potatoes up.

THE HOLLINGSWORTH HAY RAKE,

for which John G. Rollins & Co. are agents, is a very substantially made and well fitted machine. It is fitted with adjustable compound spring teeth, twenty-five in number, each of them being quite independent of the other. The upper end of the tooth plays upon a spiral spring, thus avoiding any strain upon the tooth when caught upon a stone or other obstruction, and readily adjust themselves to their places. The teeth are of spring steel, tempered in oil. Every inch of steel serves as a spring. By virtue of their adjustability the teeth can readily be adapted to every variety of work, a feature, it is claimed, which no other rake possesses. It is very easy in draft, and so simple that a boy 12 years old could work it with ease. It is not liable to get out of order.

C. AULTMAN & CO.,

Canton, Ohio, exhibit mowing, reaping, binding and harvesting machines, grain separators and cleaners, and an agricultural steam engine. For their machines they claim simplicity, quality of material, mechanical construction, durability, ease and facility of management and transportation, general adaptation to work and freedom from danger of being thrown in front of cutting bar.

THE FARMER'S FRIEND MFG. CO.,

Dayton, Ohio, exhibit their grain drill, which has been in the market for some nine years. Among its special features are the cone gearing, its double force feed, spring hoe, grass seeder, &c.

A. P. DICKEY,

Racine, Wis., exhibits a No. 1 fan of his manufacture.

WHEELER, MELLICK & CO.,

Albany, N. Y., exhibit some small models of the horse rakes made by them.

THE COLTS FIRE-ARMS CO.

exhibit in Machinery Hall an assortment of fire-arms in connection with the Baxter engines which they manufacture. The agent complains of the action of the Committee of Judges in not letting the Colts' agent know of their visit and passing upon the case with only the superficial examination possible without having it opened for close inspection of the contents.

THE GATLING GUN CO.,

of Hartford, make a fine display in the Main Building, which attracts a crowd constantly. They have three of their guns upon exhibition, one of ten barrels and one inch caliber, one of ten barrels and 45 caliber, both mounted upon field carriages, and a five-barreled gun mounted upon a tripod, which the card informs the spectator is their latest model, and fires 1000 rounds to the minute.

Honors to American Exhibitors.

We give below an additional list of honors awarded to American exhibitors at Paris. We would direct attention to the brilliant record of the agricultural machinery trade, and to the grand prizes so well earned by Profs. Edison and Gray. We desire it to be understood that this and the preceding lists are unofficial, but they are believed to be correct, and as full as we could make them from the official data:

Class No. 9.—Honorable Mention—*Brewers' Journal* of New York. The German and *Home Trades Reporter*.

Class No. 10.—Gold Medal—Byron Weston, of Dalton, Mass., record and account-book papers. Bronze Medal—Fall Mountain Paper Co., of Bellows Falls, Vt., papers.

Class No. 11.—Bronze Medal—Russell & Erwin Mfg. Co., of New Britain, Conn., designs for the decoration of door, window and fire-place furniture.

Class No. 13.—Honorable Mention—F. Tucher & Co., of Cincinnati, Ohio, iron show cards.

Class No. 24.—Bronze Medal—Thos. B. Oakley, of Paris, France, works in art in California gold and quartz.

Class No. 27.—Silver Medal—H. H. Doty, of Washington, D. C., lamp for lighthouses. Fletcher Mfg. Co., of Providence, R. I., wicks. Iden & Co., of New York, chandeliers and gas fixtures.

Class No. 40.—Bronze Medal—J. P. Lovell Sons, of Boston, Mass., arms.

Class No. 43.—Gold Medal—Henry Diston

& Sons, of Philadelphia, saws. The Dixon Crucible Co., of Jersey City, N. J., lubricating, plumbago and stove polish. Joseph Wharton, of Philadelphia, nickel and cobalt. Philadelphia and Reading Coal and Iron Co., of Philadelphia, anthracite coal; St. Louis Stamping Co., of St. Louis, Mo., granite ironware. Silver Medal—Lobdell Car Wheel Co., of Wilmington, Del., cast chilled iron rolls; Yale Lock Co., of Stamford, Conn., locks. Bronze Medal—Crane Bros., of Westfield, Conn.; Bader, Adamson & Co., of Philadelphia. Honorable Mention—Green Serpentine Marble Co., of Wilmington, Del., marble. McCurdy, of Lime, Conn., granite. Diploma—H. G. Hanks, of San Francisco, Cal., minerals. Pacific Coast Mineral Exhibit, ores.

Class No. 49.—Honorable Mention—Adams & Shaler, of New York, extract of bark.

Class No. 50.—Bronze Medal—P. S. Justice, Dixon Crucible Co., of Jersey City, N. J. Honorable Mention—Taylor & Co., of Philadelphia, crucibles.

Class No. 51.—Honorable Mention—Baugh & Sons, of Philadelphia, chemical fertilizers. Theodore Bergner, of Philadelphia, malt kiln floor. C. G. Blatchley, of Philadelphia, ice cream freezers. C. W. Facker, of Philadelphia, ice cream freezers.

Class No. 54.—Grand Prize—Jerome Wheelock, of Worcester, Mass., horizontal non-condensing steam engine with patent variable cut-off. Gold Medal—Fairbanks Co., of St. Johnsbury, Vt., scales; Howe Scale Co., Rutland, Vt., scales; H. Hall. Silver Medal—Corcoran, windmills. Chas. B. Richards, of Hartford, Conn., indicator. Honorable Mention—Altman, portable engine.

Class No. 55.—Silver Medal—Allen & Roder, of New York; Clough & Williamson. Bronze Medal—Victor Sewing Machine Co., of Middleton, Conn.

Class No. 57.—Grand Prize—Wheeler & Wilson Mfg. Co., of New York, sewing machines.

Class No. 59.—Bronze Medal—Henry Diston & Sons, of Philadelphia; Leonard Bailey & Co., of Hartford, Conn. Honorable Mention—Snell Mfg. Co., of Fiskdale, Mass.; J. J. Tower, of New York; Davids; Page Wood Type Co., of Norwich, Conn., wood printing type.

Class No. 61.—Bronze Medal—F. Ivers, of Cambridge, Mass., buggies.

Class No. 62.—Bronze Medal—Seward, of New Haven, Conn.

Class No. 63.—Silver Medal—H. G. Hadrich & Sons, of Philadelphia, harness and saddlery; Osborn & Co. Honorable Mention—J. C. Lighthouse, of Rochester, N. Y., horse collars.

Class No. 65.—Grand Prize—Thos. Edison, of Menlo Park, N. J., telephone, phonograph; Elisha Gray, of Chicago, Ill., telephone. Honorable Mention—A. G. Day.

Class No. 66.—Silver Medal—Harry Good-year, of New York, metallic shingle (not gold medal). Bronze Medal—New England Granite Co.; Thompson. Honorable Mention—T. W. Bracher, of New York; F. L. Olmstead, of New York, landscape drawings; Short; Roberts.

Class No. 67.—Bronze Medal—A. & E. Brown, of New York, siren; Wm. J. Davis, of Philadelphia, anchor. Honorable Mention—E. W. Page, of New York, boat oars.

Class No. 68.—Gold Medal—Hotchkiss. Silver Medal—Union Metallic Cartridge Co., of Bridgeport, Conn., cartridges (not honorable mention, as reported before).

Class No. 76.—Grand Prize—C. H. & L. J. McCormick, of Chicago, Ill., mowing, reaping and binding machines. Gold Medal—J. I. Case & Co., of Racine, Wis., harvesting, thrashing and cleaning machines; P. K. Dederich & Co., of Albany, N. Y., hay press, bale tie machine; Deere & Co., of Moline, Ill., gang and sulky plows; John Dodd, of Dayton, O., Hollingsworth horse hay rake; E. F. Fairbanks & Co., of St. Johnsbury, Vt., scales for weighing cattle; Farmers' Friend Mfg. Co., of Dayton, O., grain drills; Gale Mfg. Co., of Albion, Mich., hay rake and plow; Johnston Harvester Co., of Brockport, N. Y., mowers and reapers; D. M. Osborne Mfg. Co., of Auburn, N. Y., mowing and reaping machines; A. J. Reynolds, of Chicago, Ill., evaporated fruits; Warder, Mitchell & Co., of Springfield, O., mowing and reaping machines; Walter A. Wood, of Hoosick Falls, N. Y., harvesters, mowers and reapers; William Anson Wood, of Albany, N. Y., mowing and reaping machines. Silver Medal—Adriance, Platt & Co., of New York, mowers and reapers; C. Aultman & Co., of Canton, Ohio, rakes and reapers; Bay State Rake Co., of Winchendon, Mass., horse hay rake; A. M. Coates & Co., of Alliance, Ohio, hay and grain rake; A. B. Farquhar, of York, Pa., thrashing machine; Howe Scale Co., of Rutland, Vt., farm scales; Alex. Speer & Sons, of Pittsburgh, Pa., plows and cultivators; Stratton & Cullum, of Meadville, Pa., hay loader; United States Windmill Engine and Pump Co., of Batavia, Ill., windmills. Curtis, California, wine heater; Hercules Lever Jack Co., of Newark, N. J., hay press. Bronze Medal—Bickford & Hoffman, of Macedon, N. Y., seed drills. Taylor Manufacturing Company, of Westminster, Md., thrashing machine; Markt & Co., of New York, agricultural implements; Theo. F. Randolph, of Morristown, N. J., ditching machine; John W. Stoddard & Co., of Dayton, Ohio, hay rake, grain drill and seeder.

The report of the Direct United States Cable Company for the six months ending June 30, 1878, shows a revenue after deducting payments to associated companies amounting to \$279,832. The expenses were \$28,725, leaving a balance of \$50,126 profits. During the year three quarterly dividends of 1/4 per cent. each have been paid, amounting to \$45,532. A final dividend is now proposed by the Directors, making (including the three quarterly dividends above mentioned) 5 per cent. for the year, or a total of \$60,710. The reserve fund now amounts to \$40,000, while to the revenue account there is a balance of \$2933. The cost of the late expedition by the steamship *Minta* to repair the break to the cable caused by fouling of an anchor of a Gloucester fishing vessel, was \$959.

The San Francisco *Bulletin* estimates that there are \$25,000,000 of gold coin in circulation in California.

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Established 1845.

Office, foot of Houston Street, East River,
NEW YORK.The largest stock of Fire Brick of all shapes and
sizes on hand and made to order at short notice.Cupola Brick, for McKenzie Patent,
and others. Fire Mortar, Ground Brick, Clay and
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NEWTON & CO.,

Successor to

PALMER, NEWTON & CO.,

ALBANY, N. Y., Manufacturers of

FIRE BRICK Stove Linings, Range and Heater Linings Cylinder Brick, &c., &c.

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Manufacturers of

FIRE BRICK And Furnace Blocks DRAIN PIPE & LAND TILE. Woodbridge, - - - N. J.

A. HALL & SONS, Perth Amboy, N. J.

ESTABLISHED 1846.

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of reliable quality for all purposes, manufactured
at the best New Jersey Fire Clays. Also, Architecture
Terra Cotta, Fire Clay, Fire Sand, Kaolin, Ground Fire
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FIRE BRICK WORKS.

Manufacturers of Clay Retorts, Fire Bricks, Ga
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ESTABLISHED 1836.

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OF ALL SHAPES AND SIZES.Clay Gas Retorts and Retort Settings,
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Manufacturers of

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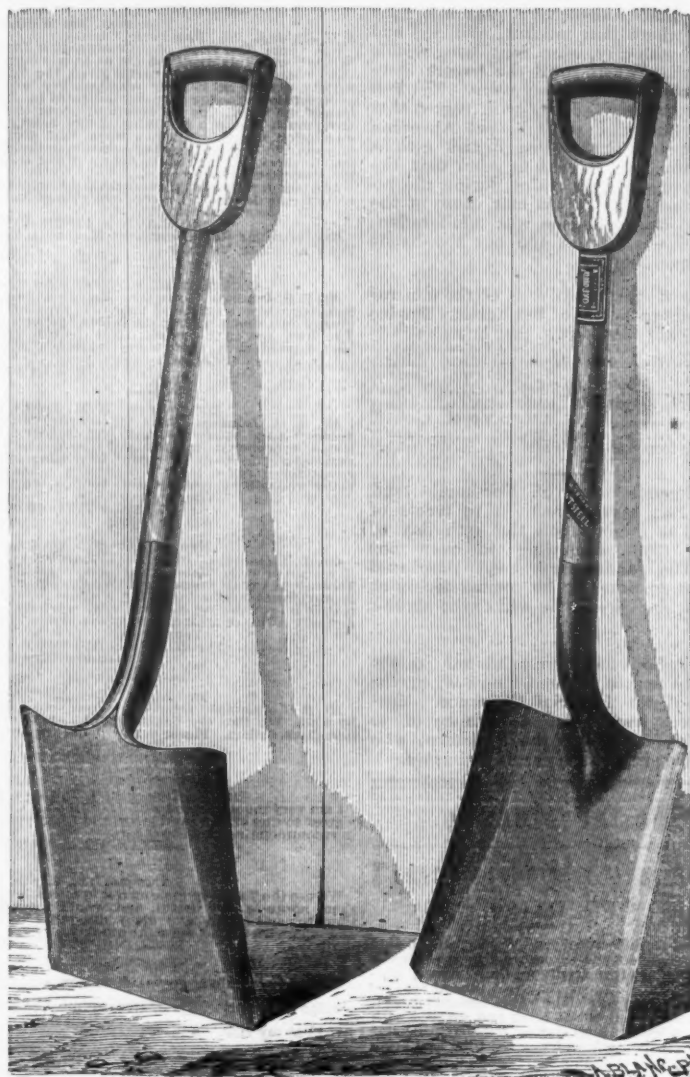
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THE OXFORD PATENT WELDED Solid Cast Steel Shovel. OIL TEMPERED.

The Oxford Patent Welded Solid Cast Steel Shovel as now furnished by us, is a new article of manufacture, of a single plate of Cast Steel, without rivets, welded by the Antrim process, with smooth surfaces front and back, and with socket continued some distance up the handle, completely encircling it in the manner of a ferrule, thus insuring a perfectly straight handle in every instance, and securing the qualities of absolute perfection of strength, and the greatest beauty of construction possible. Taken altogether, our methods will be found to obviate all the defects now so patent in all other Shovels, even those of first-class manufacture, and we will guarantee for them superior strength in parts usually the weakest, perfect symmetry and regularity of appearance, and wearing quality one-third greater than those of any other now made.

The same will apply to our Oxford Patent Welded Solid Cast Steel Spade, Long Handle Round Point Shovel and D Handle Moulder Shovels in every respect.

OXFORD Warranted Cast Steel.

Goods of this stamp are made of the very best material, and are warranted. We will always replace them with new ones in every case where reasonable satisfaction is not given.

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NEW YORK WAREHOUSE, 100 Chambers St.

MACOMBER, BIGELOW & DOWSE,
Nos. 156 and 164 Oliver St., Boston, Mass.,
NEW ENGLAND AGENTS.

Gossip about American Competition and the Exhibition of 1878.

II.

LONDON, August 9, 1878.

Before I left Paris certain of the batches of British workmen who are being sent from the different manufacturing centers of this country, had begun to arrive. It was not a little entertaining to note with how much interest they scanned the products of the United States. Industries on which these men were engaged at home had suffered from American competition; and it was one of the leading objects of their employers who contributed to the men's expenses that they should get from an examination of the specimens which we showed "wrinkles" that would enable them the more effectually to combine their respective energies to meet our competition; and not ours alone, but the competition also of France and Belgium. As to Germany proper, with Austria and Russia, not much is expressed by any English manufacturers whom I have yet met.

I don't know in what terms the Sheffield operatives will report to their employers and to their fellow workmen upon the saws on exhibition in the manufacture of which they have taken no part; but I saw Englishmen gaping at certain products in that line with eyes of experienced saw makers, yet with the surprise of men who had for the first time seen that which they never expected to see, because they had not deemed what they saw to be possible.

The \$1000 challenge was, in their view, a challenge which might be given with much more safety than many another with which they had been acquainted. Dubious they might be in the literal truth of the allegation that one of the hand saws before them might be coiled like a watch spring, yet when let go would assume its original position and do useful work; yet they could not be convinced that it was more than equal to the time-honored test which used to be thought to indicate the height of perfection, that of being bent head to heel without injury. The originality of design and cutting and the greater ease of working that resulted, were perhaps of more significance in their eyes than even the low prices at which the manufactures were offered. If the Sheffield operatives in the saw line, after having made a careful inspection of the American saws in the Exposition, do not return home better workmen, nay if they do not return home prepared to unite with their employers to compete with Disston "or any other man," they are not the men I take them for.

The wages part of the question will certainly make them sadder if the other phases of it do not make them wiser men. What other result could be expected from the prices at which saws of indisputably splendid quality were offered by American exhibitors. With cheap-jack saws, as they are termed in England, they were familiar—saws I mean made for sale from the splash-board of the peripatetic home of Dr. Marigold and his brethren of the same ilk, upon the Dutch auction principle. The prices at which "such saws to saw that ever Esau saw" were sold to these men by the manufacturers he knew they knew. Moreover they knew that they were rascally dear at the price. But that a really good hand-saw should be obtainable at eightpence in English money, and better saws at different prices up to ten-and-sixpence, English money, for a superb article, were facts that came home to him, however much better able his employer might be by reason of the cheapness of rolled steel to revise lists of prices adopted under less advantageous circumstances.

The English people, I see, are reminded in some of their own papers of the motto which spanned the transept of what they still delight to speak of as "the great" Exhibition of 1851. "Alternately the nations learn and teach" is exemplified in this Paris Exposition as it has been exemplified at no other, for at no other has one, at least, of the nations had so much to teach the rest. If we are the youngest, we have just now more to do with teaching in many of the arts of peace than we have with learning, even from the oldest. Shame to us if we do not ourselves learn much by what we see around us in Paris; but we need not, nevertheless, shrink into our boots in face of the old country or any portion of it. For this, however, we must be prepared as the result of our appearance in the French capital, that we shall have more difficulty in upholding the competition with the old country upon which we have fairly entered. The old country is becoming an apt student in the workshops of the new, and Disston and the rest of us will soon be finding it out.

America will not have taken some of her choicest goods to France without France becoming one of the first to benefit by the show. If between this and their next Exhibition these modern Gauls make as much progress in the manufacture and manipulation of metals as they have made since their '67 show, America and England alike will have to wake up. I see in metal centers in this country indications of the manipulative skill of France, indications which must be unsatisfactory in a business sense to English manufacturers in the same line. Metal wares made in France are offered here in considerable numbers. They are much less numerous than our goods, but they are quite as cheap. But I was not prepared when I left the States to see what I did see in the department of the Exposition assigned to the small metal wares of France, either as to variety, execution or cheapness. In finish the bulk of the small wares of France other than articles of Paris are much less equable than similar work sent out of English factories, and greatly so than much which is wrought in the States. But they are most of them wonderfully low in price, and striking cheapness marks even some of the wares which bear favorable comparison with some of the best of America and England. Correctly enough the hunting knives of French cutlers are cited as specimens of cutlery which the cutlers of London and Sheffield cannot afford to disregard, and if saw makers anywhere may fairly express surprise at the combined cheapness and excel-

lence of American hand-saws, so, too, may cutlers of any nation fear the enterprise of a people who in the Exposition are offering at home pocket knives "which will either cut a crust of bread, a string, or whittle a stick," at a price which means less than 2d. apiece.

In no metalliferous department, however, has France made the progress in recent times which is seen in the specimens of massive iron and steel, wrought and cast, shown in models and in kind, both within and without the chief erection. If the recent progress made by French metallurgists has been stimulated by the disasters which, as a nation, she has but newly suffered, the progress she has made in a period representing the occurrence of those disasters and their serious technical losses, is only more suggestive of her industrial capabilities. And I would have my own countrymen in the United States bear in mind that the very object at which France is most certainly aspiring, by which she fondly hopes to wipe out the disgrace of the loss of some of her most coveted territory and of eleven of her chief ironworks, is certain to promote her industrial aims and make her increasingly able to meet us and England in the metal-consuming markets upon terms as to many goods for which we are at present reluctant to give her credit.

By and by I shall have something to say about America's success, and what I consider to be America's unsucccess also, in the agricultural implement line at the Exposition. But I should like here, by way of further enforcing my warning to American manufacturers as to what they may fairly hope for from France now that they have, by showing in France, so greatly helped that nation—to direct attention to the tough job which an American State plow firm has had to beat a French plow firm, at Petit Bourre, a day's run from the capital, on the Paris and Lyons Railway. The occasion was the trial of plows shown in the Exposition. The American firm was Messrs. Deere & Co., of Moline, Ill., and the French firm was M. Meixmoron de Dombasle, of Nancy. The Deere "Spike," with four horses—the driver, of course, riding—was pitted against M. Meixmoron de Dombasle's double-shear plow, worked by six horses in pairs. The closeness of the contest between these two was the most exciting in the whole day's business. So close, indeed, was it that the jury were compelled to renew the trial under the somewhat novel conditions of working the teams alternately, four and six with each plow, before arriving at a decision. It is quite correct that "under the final conditions the American plow cut slightly deeper and broader furrows than the French one," and the French plow required all the six horses with which it started to do the work it undertook; yet the near approach of the French plow to equality with the product of a firm so well up in their business as Deere & Co. is a feather in the cap of France of no ordinary size, and will have opened the eyes of American implement makers somewhat more widely than they had expected would be likely. If these things have been done in what may be accurately regarded as "the green tree" of France's modern life, what may not be expected in the ensuing few years of her existence, which may be fairly looked to as the years of "the dry tree" of her manufacturing life. Doubtless America competes, but she must look out for competitors. VERAX.

A New System of Continuous Rolls.

We learn from the Norristown (Pa.) Herald that Messrs. Alexander Hooven and Wm. H. Adle have taken out a patent for a new invention in rolling iron. In the mill used the rolls, instead of being in pairs, are arranged in sections of three, as will be understood by the following diagram:

O
OO

In passing laterally between the two lower and the single upper roll the bar will be twice subjected to pressure and will obtain two reductions. If the number of sections is increased as in the following:

a ooo b
oooo

a bar in passing from a to b will receive two reductions from three rolls, four from five rolls, six from seven rolls, or, in any case, one reduction less than the number of rolls. From twenty rolls it will receive nineteen reductions, while if the same number of rolls were arranged in pairs it would receive but ten. The hand-labor now used in shifting the bar from one pair to the next is of course dispensed with.

When the patent was first applied for it was supposed to conflict with one taken by Mr. E. H. Davis in 1873, but on examination it was found that, although he had conceived the idea of using rolls in sections of three, the plan adopted was quite different. In the Davis mill the rolls are in pairs with single rolls between, thus:

O O O
O O O

His rolls revolve with the same velocity throughout, and as the bar in passing through increases in length, it bags down and hangs in loops between the successive pairs. In the Hooven-Adle mill the successive rolls revolve with a continually increasing velocity, proportioned to the increased length of the bar, which is thus brought out straight and finished after once passing through the mill.

No mills have yet been erected on the new plan, but the Messrs. Hooven intend to put it in operation in their mill at Norristown. Though it is stated that the model works very successfully we imagine that when it comes to practice that it will be very difficult to work. In all continuous mills where the rolls are run at different speeds, the speeding of the rolls has been a most difficult and expensive problem, and in this case it looks as though this problem would be complicated by the difficulty of getting the iron to feed from one roll to the other. Some guide certainly must be used if we understand the proposed construction of the rolls.

The Egyptian obelisk was brought into an upright position and lowered on to the pedestal on the Thames embankment Sept. 12.

MINING ITEMS.

COAL.

The mines of the Waverly Coal Company at Smithton, B. & O. R. R., have been running quite steady for the past two months, employing 100 miners. They ship, both East and West about 50,000 bushels of coal per week.

The Consolidation Coal Co., of Maryland, shipped 42,000 tons of coal from their different mines during the month of August.

Some of the works along the B. & O. R. R., near Pittsburgh, are again in operation, but not on full. The White Ball at Sharies is running two or three days per week; Bigley at Alpeville has a few men in; Armstrong's is averaging about half time; Scott & Co. at Moore's Station started up again last week, but have not put on a full force yet. They all pay 2½ cents. The Black Ball is running some little coal, and it is reported they would soon put on a full force. The large works of the Younghighy Coal Co. at Sewickley have been idle for several weeks, and no signs of starting.

About Bradford, Pa., and vicinity the long chains of coke ovens are all burning, and the atmosphere strongly rivals the Pittsburgh's "compound fumes of the infernal regions." Nearly 2000 ovens are vomiting their dense columns of smoke and soot upon the surrounding country.

The leading coal carrying companies make the following reports of their tonnage for the week ending on August 31st, and for the year to the same date, compared with their respective amounts carried to the same time last year:

	Week.	1878.	1877.	Differences.
Reading.....	151,377	4,082,450	4,991,867	Dec. 959,417
Schuylkill & N. Y.	28,157	394,350	514,450	Dec. 120,100
Lehigh Valley.....	48,127	2,354,733	2,413,012	Dec. 58,279
D. L. & Western.....	43,318	1,326,632	1,486,714	Dec. 160,082
Shamokin.....	19,318	357,095	425,740	Dec. 68,645
Central New Jer.	41,526	1,477,386	1,797,132	Dec. 319,746
United New Jer.	18,078	468,661	539,339	Dec. 70,678
Pennsylvania Coal.....	32,213	1,056,626	1,068,259	Dec. 11,633
Del. & Hudson.....	26,528	1,333,428	1,484,545	Dec. 151,117
H. & B. T.....	9,433	378,331	388,058	Dec. 9,727
Fenn & N. Y.....	17,741	701,732	854,168	Dec. 152,436
Cleaved Penn'a.....	27,000	835,336	951,016	Dec. 115,680
Anthracite.....	372,579	10,505,454	12,645,588	Dec. 2,140,134
Bituminous.....	81,602	2,046,676	2,595,952	Dec. 549,276
Total.....	454,181	12,552,130	14,739,540	Dec. 2,187,410

The quantity of coal and coke carried over the Pennsylvania Railroad for the fourth week in August was 99,600 tons, of which 80,624 tons were coal and 19,036 tons coke. The total carried for the year is 3,065,995 tons, of which 2,399,758 tons were coal and 666,237 tons coke. These figures embrace all the coal carried over the road, East and West.

The continuous rains of last week and the extraordinary downfall Thursday night brought the water in the Ohio at Pittsburgh up from 10 inches to 10 feet 6 inches.

Nearly 5,000,000 bushels had been shipped Saturday night, the fleet numbering 16 steamers, 206 barges and flat boats, and 2,358,000 bushels of coal for Cincinnati; one steamer, 17 barges and 205,000 bushels for Madison; and 15 steamers, 5 coal boats, 188 barges and 2,314,000 bushels of coal for Louisville—a total of 32 steamers, 5 coal boats, 411 barges and flat boats, and 4,877,000 bushels of coal and coke.

A statement appeared a few weeks ago that the Enterprise Colliery at Excelsior had been sold to the Philadelphia and Reading Coal and Iron Company. We are informed that this statement is not correct. Such an impression got abroad because an inventory was taken of the property in and around the colliery, but no sale has taken place.—*Shamokin Times*.

IRON.

The following table shows the total lake shipments of iron ore from the Lake Superior district this season, together with the output for a corresponding period last year:

	1878.	1877.
From Marquette.....	399,566	423,980
From Escanaba.....	314,656	289,774
From L'Anse.....	24,874	51,100
Total.....	739,136	764,754

Showing a decrease of 25,618 gross tons.—*Marquette Mining Journal*.

We clip from the *Mining Journal* the following regarding Lake Superior mines: The Lake Angeline hematite pit, adjoining the Salisbury, gives promise of developing into a most excellent mine; indeed the writer can see no reason why it should not prove equally as good as the Salisbury, with which deposit it is continuous. The Lowthian mine, belonging to the Lake Superior Company, is being made to contribute liberally to the company's average daily product under the superintendence of Capt. Jeff Day. The Lowthian is the first of the group of mines west of the Winthrop, the ores of the two being of the same general character. The Winthrop, which had not mined a ton of ore the present season previous to July 1, will have shipped at least 20,000 tons by the close of navigation, all of which has been sold. The mine itself is looking well, though it will be necessary to remove 20,000 or 25,000 tons of rock the coming winter in order to render future mining operations safe and profitable. Thus far, notwithstanding the difficulties, the management have had to contend with, the Salisbury leads all the other hematite mines as to the amount of ore raised and shipped, and should no further accidents occur the product will be increased to nearly, if not quite, 45,000 tons before the close of the season. The advance in grain freights has attracted to that trade many ore vessels, and as a consequence there is a most decided advance in ore freights—one that is calculated, if it continues, to nearly, if not quite, put an end to shipments for the balance of the season. This state of affairs has been brought about by the diversion in favor of Chicago, created by the yellow fever along the Mississippi, and which has thrown into that port the great bulk of the river grain trade. It is hoped, and believed, however, that it will not long continue; the rush of vessels to Chicago for grain can hardly fail to have such an effect upon the rates that many of them, after making one trip, will be glad to resume their places in the ore fleet. Should it prove otherwise, many of our mines will be compelled to materially curtail mining operations, since they cannot possibly pay the rates demanded without loss. At present the docks are all full, and but little ore

is being forwarded, except from those mines which are so unfortunate as to have made contracts which must be filled. The others are holding off for better rates, and will ship no more ore during the remainder of the season unless the vessel owners come down to something near what was, until quite recently, the prevailing rates.

PRECIOUS METALS.

The Silver Islet Mine, at Wyandotte, Mich., produced \$40,000 worth of silver week before last.

A large quantity of silver ore was found recently on the farm of Mr. Robertson, in the Northwestern part of Metcalfe county, the ore has been examined by Mr. Delvaux, a silversmith, in Glasgow. Steps have already been taken to work the hill where the precious metal has been found.—*Hart County (Ky.) Democrat*.

From the Gold Hill News of Sept. 4 we have the following: Consolidated Virginia.—Daily yield of ore, 200 tons, which is being crushed as fast as it is extracted. California.—Daily yield, 250 tons of ore, keeping the battery mill steadily running. The ore stops going northeast on the 1750 level still continue to show well.

New diggings of gold-bearing gravel have been brought to notice recently in the vicinity of Round Mountain, above Nevada City, and are attracting considerable attention. It is supposed to be a branch of the Blue Tent lead. A party of 32 persons have located 640 acres, named their company the Atlanta and intend to start work soon.

Shipments of Bullion from the various mines have been as follows: Northern Belle, Aug. 26, \$4,129.24; 28, \$3,943.35; 31, \$4,963.28; Raymond & Ely, Aug. 24, \$11,987.31; \$4,168.79; Tybo Con., Aug. 26, \$5,473.13; total to date, \$56,523.03; 31, \$4,411.35; total for August, \$60,934.38; Manhattan, Aug. 30, \$12,700; Leopard, Aug. 30, \$3,400; California, Aug. 31, \$42,135; total to date, \$158,848.94; Con. Virginia, Aug. 31, \$28,771.27; total to date, \$152,506.39; Bodie, 31, \$25,000; Christy, 30, \$5653; McCrackin, 31, \$9,632.40; Extra, 31, \$2822; Hackberry, 31, \$6,853.09; Alexander, Sept. 2, \$4977.66; Moore's Flat, Aug. 26, \$12,000; Aug. 28, \$14,000; Black Jack, Silver City, Idaho, \$7,787.08; Monarch, Atlanta, \$7475; Standard, Sept. 2, \$20,955.31.—*Mining and Scientific Press*, Sept. 7.

COPPER.

The San Francisco Copper Mining Company, at Spenceville, Nev., is now shipping 30 tons of pure copper per month, and during the coming fall will increase their shipments to 50 tons per month.

MISCELLANEOUS.

The face of the Suro Tunnel is now in a distance of 20,500 feet, at which point the tunnel has been temporarily stopped on account of the necessity of using the air pipes and drilling machinery for driving the south branch of the tunnel running to connect with the Julia shaft, which is now well under way and is being pushed ahead with great vigor.

LABOR NOTES.

The deadlock in the Philadelphia iron dispute was broken on Tuesday, operations being commenced at the works of the Philadelphia Iron and Steel Company. Reports that this action was to be taken were rife in Kensington on Monday evening, but these were met with a general expression of disbelief on the part of the striking hands. Tuesday morning the truth of the rumors was verified by the smoke which issued from the chimneys at an early hour. The strikers and their families were seen collected in crowds about the vicinity, but the presence of about fifty police officers had the effect of repressing any hostile manifestations. At noon another crowd collected around the works in anticipation that the new hands would leave for dinner, but they had forewarned themselves by carrying their dinner with them into the works. The engineers and laborers, however, who left the works for a breath of fresh air were plying with questions by the outsiders, and some strong talk was indulged in when it was learned that nearly thirty puddlers and heaters were at work. Apprehensions were entertained during the afternoon that some attempt to intimidate the new hands would be made when they left the works for the day. These expectations were, however, disappointed, and when 4 o'clock came a few pedestrians and the police were the sole occupants of the vicinity. The men left the works in gangs at short intervals, with police following closely in their rear, but their services were in no place called into request. Some of the other mills will probably be started up with non-unionist hands in the course of a few days. Meanwhile the district is to be guarded day and night with police until it is certain that the riotous scenes of a week or two ago will not be repeated.

The Monongahela River coal miners have decided to demand 2 cents per bushel in the fourth pool mines and 2½ cents in the first, second and third pools. The works along the river are generally suspended.

The mines of Clay county, Ind., are out on a strike for an advance of 10 cents per ton.

The trouble at Tyson Mines, Lehigh, Iowa, is over, and 95 cents per ton is paid. The strike among the coal miners engaged in the coal works on the Monongahela River continues, for the reason, as the operators state, that no coal is wanted and no one desires to load for future delivery. While some works were paying 1¼ cents per bushel for mining, others were paying 2 cents and 2½ cents per bushel. The miners resolved to call a meeting and establish a uniform price for mining in the different pools. The result was an agreement to demand 2 cents per bushel in the fourth pool and 2½ cents in the first, second and third pools.

An invention which promises to be of great importance to the whaling interest in the taking of oil, has recently been brought out by H. W. Mason, of New Bedford. The invention consists in a harpoon with which whales can be struck with perfect certainty at a distance of 10 or 12 fathoms, making it easy to secure whales which it is next

to impossible to get near enough to strike with a harpoon thrown by hand. The harpoon is of novel construction, and is shot from a gun weighing only 24 pounds which is handled as easily as a forest gun. Mr. Mason overcomes the difficulty of firing with accuracy a harpoon with line attached, by coiling the line on the gun in such a manner that the coils follow the line of shot and thus serve to guide the harpoon straight to the mark. This invention has passed the experimental stage, and is a practical success. Its general adoption by whalers can only be a question of time, as already some of the most experienced whalers give it their unqualified approval.

China and India were especially the markets where thin muslins, stiffened and weighted with clay, were considered salable by British weavers until the buyers there learned how worthless they were. The *Pall Mall Gazette* now admits with regret that the superior and more honest American goods are steadily crowding British cottons out of China, and it calls to mind that the factory hands of Lancashire, during the recent strikes, urged that one cause of the depressed state of trade was adulteration, for which the masters and not the hands were responsible.

The latest official statistics of the mineral and metal production of the Russian Empire for the fiscal year of 1876 are, in tons:

Gold.....	27,793	Coke pig iron.....	16,730
Silver.....	23,927	Wrought iron.....	292,699
Platinum.....	1,526	Steel.....	17,916
Lead.....	1,468	Anthracite.....	545,037
Copper.....	3,873	Bituminous coal.....	1,248,816
Zinc.....	4,622	Lignite.....	29,275
Charcoal pig iron.....	424,823	Salt.....	716,458

The Commissioners of Northumberland County, Pa., have advertised 19 tracts of coal land at Sunbury on the 15th day of October, 1878, amounting to over 2000 acres. The lands have been purchased from time to time by the commissioners at tax sales, and are to be sold to the highest bidder.

The telephone has been exhibited on the Island of Formosa, in the China Sea, in the presence of the Imperial Governor. Messages were transmitted a distance of 30 miles, to the surprise of the Chinamen, who showed deep interest in the experiments.

Special Notices.

For Sale or to Rent! RARE OPPORTUNITY!!

Richmond Architectural Iron Works, established for more than 20 years, embracing a centrally located lot of 130 feet front on Cary street, running back on the line of Eleventh Street 150 feet to an alley 50 feet wide. The improvements consist of a machine shop, built of brick and covered with slate, 60x150 feet, 3 full stories, exclusive of cellar and attic. A brick foundry 40x90 feet, and brick offices and pattern shop, 30x60 feet. In the foundry are two large cranes, No. 3 McKendzie Cupola and Sturtevant blower. The machine shop embraces a complete outfit of valuable tools, as Machine Lathes, Drill Presses, Iron Planer, Bolt Cutter, Emery Machines, &c. A collection of patterns of great variety, embracing almost every order of architecture. In fact every thing necessary to "start up" the works at once for a business of \$100,000 per annum. The property will be sold at a great sacrifice from the original cost.

Purchaser can divide the machinery, patterns &c., from the real estate if he does not care to buy the latter. Proffers for a lease of the whole property; or for the machinery, patterns, &c., with such portions of the real estate as may be needed for the conduct of the business will be entertained. Apply in person or by letter to
WM. L. COWARD, Pres't,
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Price Books.

Large Size, Full Leather.....	\$12.00
" Half.....	10.00
Pocket " Full.....	5.00
Send for circular.	

BUELL LAMBERSON,
No. 97 Chambers Street, - New York.
These books may also be had at publishers' prices of
WM. BLAIR & CO., Chicago,
and A. F. SHAFLEY & CO., St. Louis.

For Sale,

Hardware, stove and implement business, located in one of the best towns in northeastern Missouri. Stock will invoice \$5000. Will sell all or part. Reason for selling, wish to engage in wholesale trade. For further information, address
J. N. ALLEN,
Kansas City, Mo.

To Manufacturers, &c. FLOWER PINS.

Something new, made of light wire, for the use of florists and others. Patent allowed and offered for sale, either before or after issue. For specimen card of pins or further information address the inventor, J. H. PLUMMER, 1275 Pacific St., Brooklyn, N. Y. B. Specimen cards not intended for parties who only wish to buy or deal in the pins, which are not yet manufactured for public sale, and if they desire to obtain one must remit fifteen cents (stamps taken), but any information desired will be given free.

FOR SALE.

One Set Eccentric or Die Rolls.

HENRY DISSTON & SONS,
Philadelphia, Pa.

Wanted,

By an extensive manufacturer of general hardware, an experienced and popular hardware salesman. He must be well acquainted with the Hardware Jobbers in Western Pennsylvania, Ohio and Indiana. Address, with reference as to character, sobriety, &c.,
Box 5588 New York Post Office.

Wanted,

A foreman to take charge of a Malleable Iron Foundry. Must be a man of experience and one who understands thoroughly the business in all its details of manufacturing. Address, stating past experience and giving references,
Box 324 Milwaukee, Wis.

Special Notices. JENNINGS'S COMBINATION DISCOUNT TABLES.

(Published by the author.)

OPINIONS.
37 Chambers St., New York, 1878.
We find them correct and wonderfully "labor-saving."
SARGENT & CO.

54 Chambers St., New York, 1878.
We find everything "O. K.," and consider it of great use in our office work.
SPENCER & UNDERHILL.

MONTREAL, March 4th, 1878.
S. H. Jennings, Esq., Deep River, Conn.
DEAR SIR: The book of "Combination Discount Tables" was duly received by us as per our order. The writer has since its receipt given the Tables a variety of tests as to their practicability, accuracy and usefulness for the purposes indicated in the preface of the work. As the result of these tests, we have much pleasure in giving it our hearty commendation, and think it is a work that should be possessed by everyone having occasion in their business to check or arrive at the net results of combination discounts from invoices. As a convenience of the mental forces employed in tedious calculations it is worth many times its cost. Yours respectfully,
MORLAND, WATSON & CO.,
Hardware and Metal Merchants, MONTREAL, CANADA.
Per WM. SMILL, Manager.

POUGHKEEPSIE, N. Y., February 23, 1878.
Mr. S. H. Jennings, DEAR SIR—Enclosed please find \$2.00 for which send us by mail one copy of "Jennings's Combination Discount Tables," as noticed in *The Iron Age* of this week. Trusting it is what we have wanted many, many times, we are,
Yours respectfully,
ELSWORTH & DUDLEY.

POUGHKEEPSIE, N. Y., April 1, 1878.
Mr. S. H. Jennings, DEAR SIR—Your "Discount Tables" came safely to hand, and the writer has tested it pretty thoroughly and very satisfactorily. Particularly do we find it useful in getting cost on goods for MARK & them. Trusting you may find many who will express the same opinion, we are,
Yours respectfully,
ELSWORTH & DUDLEY.

NEW ALBANY, IND., April 23, 1878.
Mr. S. H. Jennings, DEAR SIR—Please let us know if we can procure "Jennings's Combination Discount Tables" in any city near here. We wish to examine it previous to purchasing. If you would like to send C. O. D., you paying charges, with privilege of examination before taking, you may send one. Yours truly,
TERSTEGGE, GOHMANN & CO.,
National Stove Works.

NEW ALBANY, IND., April 30, 1878.
Mr. S. H. Jennings, DEAR SIR—Your book received by mail. We like the Tables very much. Enclosed find three dollars. Please acknowledge receipt. Yours truly,
TERSTEGGE, GOHMANN & CO.

NICHOLS, TOGA CO., N. Y., May 9, 1878.
I am very much pleased with the Tables. They are a great saving of time and labor, and I take pleasure in recommending them to others.
ALEXANDER A. SWINTON.

ROCKFORD, ILL., May 20, 1878.
We use the Tables in making out invoices and find them accurate and useful, and would recommend them to parties who have many discounts to make and who wish to find the same quickly.
ROCKFORD BOLT WORKS.

It will be mailed, postpaid, to any address, on receipt of the price, \$3. Currency may be sent by mail at my risk. Address
S. H. JENNINGS,
Deep River, Conn.

Bissell & Welles, Wholesale Hardware Auctioneers, 83 Chambers and 65 Reade Sts., N. Y.

Sales held weekly for the trade. Consignments solicited. We refer to the leading Manufacturers and Importers.

Wanted,

A ROLLING MILL FOREMAN.

He must be a good practical Heater, Roller and Roll Turner. None need apply without good references as to character. Address,
B. H. S. W.,
Office of *The Iron Age*, 83 Reade St., N. Y.

Second-Hand Machinery For Sale Low.

SEND FOR LIST.

Engine Lathe, built by Seth Wilmarth, 82 in. swing, 3 1/2 ft. bed, live spindle hollow, face plate both ends, one at front 6 ft. 4 in. diameter, one at rear 7 ft. 1 1/2 in. diameter, two boring bars traversed by tail spindle, both arranged for spinning key ways; one of these bars is designed for work on rear face plate and has yoke to support outer end; on either face plate work may be bored, turned and splined without removing the fastenings. At rear face plate an adjustable bed 11 feet long, carrying an adjustable tool rest, the latter having 3 ft. 6 in. traverse, arranged to sit at any angle and in any position on above bed. Tail spindle is 5 1/2 in. square, carriage is fed by a screw the full length of bed, cross feed automatic, 5 grades of feed to operate either, 10 grades of speed for live spindle, driving movement gears direct to front face plate, complete with counter-shaft for driving, spinning and feeding. One large saddle or center rest.
Planer, built by W. Collier & Co., Salford, Eng., 16 ft. 6 in. wide, 28 in. ft. long, automatic cross, vertical and angular feed, platen driven by gearing into step rack, return motion about 3 to 1; has third upright with vertical tool slider, automatic feed, to plane work that will not pass between the regular uprights. This slider has a vertical movement of 5 ft. 4 in. Counter-shaft.
HOLYOKE MACHINE CO.,
Holyoke, Mass.

SPECIAL NOTICE.

The undersigned offer their services as agents to American Producers of Metals. They represent foreign brands of
Zinc, Russia Iron, Hoop Iron, Window Glass, Cutlery and Guns.
LOUIS WINDMULLER & ROELKER,
90 Reade Street, N. Y.

J. H. JENKS & CO., Manufacturing Machinists, 180 Centre Street, New York,

are prepared, with a superior equipment of first-class tools and experienced mechanics, to contract for the designing and construction of special Tools, Dies, Jigs and Gages for duplicating interchangeable parts of fine machinery or sheet metal goods. Contracts for manufacturing staple goods in quantity solicited.

TRAVELING SALESMEN WANTED.

Those that have a first class trade and are thoroughly acquainted with the Iron Founders of the United States. Address, with references,
B. J. C., Box 22,
Office of *The Iron Age*, 83 Reade St., N. Y.

Special Notices.

W. GARNER, General Merchant,

Mouldsworth, near Chester, England,
Supplies nearly every class of Goods,
including all kinds of

Agricultural Machinery, Domestic Machines, SEWING MACHINES

And Artificial Manures.

W. GARNER is open to represent any Foreign Manufacturers in England for the sale of their manufactures of whatever nature or kind. Having a wide and well established connection in the Provinces, could introduce some American, German and French products to mutual advantage.

W. GARNER is also open to buy any kind of Goods on commission, and ship them to any part of the world. Manufacturers or others desiring his assistance will please address (with full particulars in English) as above.

Second-Hand Machinery.

One 14 in. 30 in. Whitehill & Smith Adj. Cut-off Engine, Wheel 10 ft. diam., and
One 54 in. 18 ft. Tab'r Boiler for same; both almost new.
One 10 in. 22 in. Fishkill Landing Engine, and
One 8 in. 24 in. Tab'r Boiler for same.
One 10 in. 24 in. Harris Corlies Engine, with Boiler, Pump and Heater, never run, price very low.
One 26 in. 17 1/2 ft. Engine Lathe, Rod and Cross Feed.
One 22 in. 16 ft. Engine Lathe, Rod and Cross Feed.
Two 15 in. Pratt & Whitney Engine Lathes, with Taper Attachment. One Lincoln Gear Cutter, nearly new. Two Lincoln Milling Machines. Four Brainard Milling Machines. One each 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100. One 25 lb. Merrill Drop Hammer, good as new. 70 feet 22 in. Double belt 30 ft. 10 in. Double Belt.

E. P. BULLARD, 14 Dey St., New York.

AUSTRALIA.

AMERICAN HARDWARE CO.,
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Solicit correspondence with American manufacturers desirous of representation in the Australian Colonies. Consignments will have prompt attention. References furnished.

MILLET & BILGER, Auctioneers and Commission Merchants, 112 Chambers St., New York,

Solicit from manufacturers, importers and jobbers consignments of Hardware, Cutlery, House Furnishings, Goods, &c., for their regular weekly sales.
C. A. MILLET, formerly of Bissell, Welles & Millet.
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The Sherman Process Co.

9 Pemberton Square, Boston, Mass.,
Issue Licenses to use the Process for the Manufacture of Iron and Steel
In the Bessemer Converter, Crucible, Siemens-Martin, Puddling, Blast and Cupola Furnaces.
The use of this Process improves the quality of the product, saves fuel and labor, and does not require any change in furnace or manner of working. See page 17 of *The Iron Age* of Oct. 25th, 1877.

Wanted—A Partner,

In a foundry and machine business, already well established. Locality splendid and healthy. A practical man with means is wanted to join a practical man who is already well established. Address
OAR WHEEL FOUNDRY,
P. O. Box 134, Selma, Alabama.

To Manufacturers and Jobbers of Hardware, Cutlery, &c.

Manufacturers and Jobbers, having surplus stocks or goods that from any cause are unsalable upon which they wish to realize, or assignees who have stocks to dispose of, will find a cash purchaser by communicating with
W. M. CALDWELL,
Dealer in
Job and Auction Lots of Hardware, Cutlery, &c.,
103 Chambers St., New York.

To Steel Manufacturers.

An energetic young man with scientific training, who has had experience in the manufacture of Bessemer and Crucible Steel, in preference to remaining unemployed would be willing to take a subordinate

Trade Report.

Office of The Iron Age,
Wednesday Evening, Sept. 12, 1878.

The local money market continues very easy, and borrowers on call are abundantly supplied at 1½ @ 3%. The discount rate on prime business paper is 4 @ 5%. General trade is in a fairly satisfactory condition, and in many departments active. There is less complaint of dullness and disappointment than might be expected, except among those doing a Southwestern trade. Business with the Southern seaboard is very active, and hopes are entertained of a revival in business along the Lower Mississippi and the Gulf, when the yellow fever, which seems to have passed its climax, shall disappear. During the early part of the week gold declined to 100½ on the strength of Secretary Sherman's order directing the exchange of silver dollars for greenbacks in any quantity. This order removed the necessity for buying gold for the payment of duties; but it was subsequently revoked when it was found that the department lacked the warrant of law for anticipating the first of January in beginning specie payments. Gold consequently advanced to 100½. All sales have been at 100½ and 100¾.

Government bonds are firm and active for the 5s of 1881, 6s of 1881, 4½s and 5-20s of 1867. On Monday the Treasury Department called \$2,000,000 of coupon bonds dated July 1, 1855, and \$5,000,000 of registered bonds of the class redeemable after July 1, 1870. State bonds are quiet and firm. Railway mortgages are generally higher.

The stock market has been dull and irregular. The principal dealings have been in St. Paul, Northwest, Lake Shore and D. L. & Western.

The weekly statement of the New York banks shows a decrease of \$190,700 in total reserve, and \$580,150 in surplus reserve, the latter now standing at \$12,878,650.

The following are the figures:

	Sept. 7.	Sept. 14.	Differences.
Loans.....	\$43,432,000	\$44,215,100	Inc. \$782,000
Specie.....	16,953,100	16,554,700	Dec. 398,400
Legal tenders.....	50,683,500	48,891,300	Dec. 1,792,200
Deposits.....	216,711,000	218,050,000	Inc. 1,339,000
Circulation.....	19,059,300	19,478,300	Inc. 419,000

The foreign trade movements for the week are shown in the following tables:

For week ended Sept. 10:

	1876.	1877.	1878.
Total for week.....	\$5,001,875	\$6,337,687	\$5,410,240
Prev. reported.....	204,003,602	231,404,237	198,001,230

Since Jan. 1.....\$209,005,477 \$237,801,024 \$203,411,470

Included in the imports of general merchandise were articles valued as follows:

	Quantity.	Value.
Brass goods.....	21	\$2,235
Bronzes.....	84	7,177
Chains and anchors.....	17	820
Copper.....	1,005	1,005
Cutlery.....	97	27,614
Gunns.....	42	13,612
Hardware.....	61	2,588
Iron, pig, tons.....	4,396	4,396
Iron, sheet, tons.....	18	1,722
Iron, ore, tons.....	734	1,853
Iron, other, tons.....	1,578	43,429
Metal goods.....	18	16,078
Needles.....	11	5,243
Old metal.....	331	331
Platina.....	1	1,933
Per. caps.....	21	3,702
Saddlery.....	18	3,904
Steel.....	9,557	107,763
Tin, bbs.....	122,497	107,763
Tin, bbls.....	10	332
Tin, 407 slabs.....	344,749	46,177
Wire.....	17	6,140

EXPORTS, EXCLUSIVE OF SPECIE.

For week ended Sept. 17:

	1876.	1877.	1878.
For the week.....	\$5,422,571	\$6,551,589	\$7,799,540
Prev. reported.....	181,437,137	188,799,911	239,036,754

Since Jan. 1.....\$186,859,708 \$195,344,500 \$246,836,294

EXPORTS OF SPECIE.

For week ended Sept. 10:

	1876.	1877.	1878.
Total for week.....	\$160,218	\$160,218	\$160,218
Previously reported.....	10,259,445	10,259,445	10,259,445
Total since Jan. 1, 1878.....	\$10,410,663	\$10,410,663	\$10,410,663
Same time in 1877.....	40,266,445	40,266,445	40,266,445
Same time in 1876.....	54,529,889	54,529,889	54,529,889
Same time in 1875.....	41,839,443	41,839,443	41,839,443
Same time in 1874.....	40,266,445	40,266,445	40,266,445
Same time in 1873.....	57,252,800	57,252,800	57,252,800

Government bonds close as follows:

	Bid.	Asked.
U. S. Currency 6's.....	119½	120
U. S. 6's 1881 registered.....	107½	108
U. S. 6's 1881 coupon.....	107½	108
U. S. 6's 1885 new reg.....	107½	108
U. S. 6's 1885 coupon.....	107½	108
U. S. 6's 1887 reg.....	107½	108
U. S. 6's 1887 coupon.....	107½	108
U. S. 6's 1888 reg.....	107	108
U. S. 6's 1888 coupon.....	107	108
U. S. 10-40 reg.....	106¼	106½
U. S. 10-40 coupon.....	106¼	106½
U. S. 5's 1881 registered.....	105½	106
U. S. 5's 1881 coupon.....	105½	106
U. S. 4½'s 1881 registered.....	105½	106
U. S. 4½'s 1881 coupon.....	105½	106
U. S. 4's 1897 registered.....	105½	106
U. S. 4's 1897 coupon.....	105½	106

The following were the closing quotations of active shares:

Atlantic and Pacific Telegraph.....	30
Chicago and Northwest.....	36½
Chicago, Rock Island and Pacific.....	117½
Chicago, Bur. and Quincy.....	110½
Col. Chicago and Ind. Central.....	4½
Clev. Col. and Ind. Central.....	32½
Cleveland and Pittsburgh.....	80½
Chicago and Alton.....	83½
Canton.....	17
Delaware, Lack. and Western.....	53
Delaware and Hudson Canal.....	50½
Express-Adams.....	104½
United States.....	49½
Wells, Fargo & Co.....	92
Erie.....	13½
Harlem.....	120½
Hannibal and St. Joseph.....	15½
Illinois Central.....	30
Kansas and Texas.....	30½
Lake Shore.....	68
Michigan Central.....	71
Morris and Essex.....	83½
Milwaukee and St. Paul.....	29½
Union Pacific.....	66½
Western Union Telegraph.....	96½

New York Central.....	113½	114
New Jersey Central.....	37½	38
New Jersey Southern.....	8½	8½
Ohio and Mississippi.....	17½	17½
Pacific Mail.....	124	124
Panama.....	98	98
Pittsburgh and Fort Wayne.....	12	12
Quicksilver.....	32	34
St. Louis Kansas City Northern.....	4½	4½
Toledo, Wabash & Western.....	14½	14½
Union Pacific.....	66½	66½
Western Union Telegraph.....	96	96½

GENERAL HARDWARE.

Business this week is active in nearly every department of the Hardware trade. In the matter of changes in prices there is unusually little to report.

The demand for Nails is fairly active. Some houses in the trade report a stronger tendency as to prices, but we fail to find any quotable change. We quote as before, rod, to 60d., \$2.20, net; for orders of 100 kegs and over this figure would be shaded.

In the list of awards to American exhibitors at the Paris Exposition, published in our last issue, the Stanley Rule and Level Co., to whom a bronze medal is awarded (in Class No. 59), is erroneously put down as of St. Louis, Mo. As is well known in trade circles, the company have their factories at New Britain, Conn., and their warehouses at 29 Chambers street, in this city.

Clark & Co., Buffalo, N. Y., have issued, under date of 20th inst., a circular in which they illustrate the "Buffalo Noiseless" No. 50 Blind Hinge. In this Hinge, which was patented Sept. 13, 1878, the upper and lower Hinges are alike. We take the following from their circular: The Blind when open fastens parallel with, and not against the house, and is locked at top and bottom. We are now prepared to furnish this Blind Hinge to the trade, and guarantee the same to be superior to any competing Blind Hinge in the market. From this date and until further notice, the price of the "Buffalo Noiseless" Blind Hinge will be as follows:

For wood, throws the Blind 1¼ inches from the casing.....Per dozen sets, \$3.50
Discount, 75 per cent.

An illustration of this Blind Hinge will be found in their advertisement on page 13.

Hatry & Friend, Pittsburgh, Pa., inform us that an error occurred in their circular which we copied in last week's issue—the price of Junata Horse and Mule Shoes should be 3½ and 4½ cents respectively, instead of 3¼ and 4¼ cents as printed.

The manufacturers of Manila and Sisal Rope have reduced the list price of Manila ¼ cents per pound, making ½ inch and over 1¼ cents; and Sisal, 1¼ cents per pound, making ½ inch and over 9¼ cents per pound. The revised price list will be found in our price current on page 30.

Henry W. Kip, Buffalo, N. Y., has issued, under date of 5th inst., a revised price list of his Cast Steel Hammers. We print below the old and new prices of those goods the prices of which have been changed:

	Old price.	New price.
Adze Eye Bell Face Hammers.		
No. 1.....	\$10.00	\$9.50
No. 1½.....	9.00	8.50
No. 2.....	8.00	7.50
No. 3.....	7.00	6.50

	Old price.	New price.
FARRIER'S HAMMERS.		
Adze Eye.....	\$8.00	\$7.00
Buffalo Pattern.....	8.00	7.00

Quackenbush, Townsend & Co., No. 85 Chambers street, have reduced the price of their "Challenge" Door Springs to discount 30 per cent. The list remains as before.

IRON.

American Pig.—The same dullness and lack of confidence which has characterized the market for Pig Metal for a long time, still prevails. Sales are reported of 3000 tons Gray Forge, 1000 tons No. 1 and 1500 tons No. 2 Foundry North River Irons, all on private terms. Makers of Lehigh brands inform us that they will not meet the minimum rates at which some brands of good Iron are being offered, and that in consequence many of their old customers are buying elsewhere. We quote, nominally, Foundry No. 1, \$16.50 @ \$17; Foundry No. 2, \$15.50 @ \$16.50; Gray Forge, \$14.50 @ \$15.50.

Scotch Pig.—The demand continues light, and is, with few exceptions, confined to the supply of the local demand. We hear of the sale of 200 tons Scotch Iron, but both brand and price are withheld. We learn from good authority that stocks of Pig Iron are accumulating fast in Scotland in makers' hands. The stock in store September 7th, 1878, was 192,184 tons, against 158,700 tons for the corresponding time last year. These figures are independent of the large stocks known to be held by makers. We quote, for small lots: Glengarnock, \$23.75; Eglinton, \$22.75; Coltness, \$24.

Rails.—Sales are reported of 1000 tons Steel Rails September and October delivery at \$45, and 10,000 tons for Western delivery at a price which has not transpired. We quote Steel at mill, \$43 @ \$44, and Iron, according to quality, terms of payment, &c., \$32 @ \$36.

Old Rails.—We hear of the sale of 1000 tons on private terms. We quote, nominally, \$17 @ \$18.

Scrap.—There is little demand or inquiry for Scrap Iron at present. The only sale we hear of is a lot of 600 tons No. 1 Wrought on terms which are not made public. We quote No. 1 Wrought from yard, \$21 @ \$22.

METALS.

Copper.—The market has been moderately active, sales summing up 350,000 pounds. Lake Superior at 16¢ @ 16½¢; Baltimore we quote 16¢. Nothing has transpired in futures. The cable reports no change in England. We take the following from the London Mining Journal of Sept. 7: "We have touched the price of £60 per ton for Chili Bars, an event which no reader of this journal can be surprised at. Copper altogether has now reached the lowest prices ever known, at the same time the stocks have never been as large as at the present moment. The great question is now, Does the one circumstance compensate for the other? We think that if trade revives one or two months of good consumption and consequent large deliveries from the stocks would easily reduce statistics to figures reached in former years when prices ruled higher. The deliveries for the second half of August have been satisfactory—3151 tons in England and France, and the statistics of September 1 show nearly 1000 tons reduction from those of August 15, and are not worse than those of August 1. Unfortunately the charters from Chili for the second half of August have been 4000 tons, so that most probably the statistics of October 1 next will show an increase on comparison with those of the 1st instant." There has been a moderate inquiry for manufactured Copper at the combination prices which have ruled for some time past, but trade is not reported to be brisk. Yellow Sheathing Metal is quiet but unchanged, English being in some inquiry, but American dull. We quote: New Sheathing Copper, 26¢; Braziers, 28¢; and Bolts, 28¢; American Yellow Sheathing Metal, 13¢ @ 13½¢; Yellow Metal Bolts, 25¢; and English Yellow Sheathing Metal, 12½¢ @ 13¢, currency, in bond.

Tin.—Our market continues lifeless, in sympathy with declining foreign markets. We quote as follows: Straits, 13½¢ @ 13¾¢; English Refined, 13¾¢ @ 14½¢; common ditto, 13½¢ @ 13¾¢; both nominally; Australian, 13½¢ @ 13¾¢, and Banca, 16½¢ @ 16¾¢; all large lines. Since our last report 2000 slabs Straits have arrived here, and about 4000 slabs are due in a few days by steamer Glamis Castle direct from Singapore. The London and Singapore markets have declined, the former to £57 @ £57.10 and the latter to \$17.75. Straits floats are being offered here at 13¢ without finding buyers. The recently smaller shipments from the Straits to the United States are fully counterbalanced by larger Australian shipments to this country. The mail from London of Sept. 7 brings the monthly statistics, the visible supply in England and Holland being 17,872 tons, against 16,654 Sept. 1, 1877, and 14,520 Sept. 1, 1876. Tin Plates are quiet, but steady; Coke Tin is most in demand at present. We quote per box, ordinary brands, large lots, as follows: Charcoal Bright, \$5.40 @ \$6; do. Ternes, \$5.40 @ \$5.50; Coke Tin, \$4.62½ @ \$4.75, and do. Ternes, \$4.62½ @ \$4.75. The following is from Liverpool dated Sept. 5: "Coke Tins at date are completely demoralized by the pressure to sell a large stock of a local speculator. The effect of a sale some 6d. to 9d. below makers' prices will keep the market depressed for some time, and this same result will be helped by the considerable losses several of our manufacturers have incurred by the failure. Charcoal Tins and Ternes are hardly affected, and are held for much higher figures comparatively. Demand all round is extremely light."

Lead has been moving off steadily at declining prices, 500 tons common Domestic changing hands at 3½¢ @ 3.40¢, closing at 3½¢. Fine Lead will bring 3½¢. Manufacturers are fairly stocked with common Domestic Lead, and arrivals are sufficiently large to supply whatever there is of current demand. The English market remains easy, but a further notable decline was checked, when the last mail left, by the news by cable that we had improved here, an improvement of short duration. Manufacturers' prices remain unchanged, and we quote Bar, 5¢; Pipe, 5¢; Sheet, 6¢; Tin-lined Pipe, 12¢; No. 1 Solder, 8½¢, all less 10¢ to the trade.

Spelter and Zinc.—There is but a moderate demand here, and Common Domestic Spelter cannot be quoted any better than 4½¢ @ 5¢. Silesian may be quoted 5½¢ @ 5½¢, nominally. The following is from London, dated 7th inst.: "The market is quiet; stocks have slightly increased, there being 1745 tons on the 1st inst. in England, against 1515 on Aug. 1 last." Sheet Zinc.—The market is quiet and nominal. We quote: Domestic, 6½¢ @ 6½¢, and Mosselman, 7½¢ @ 7½¢.

Nickel.—Dispatches per cable have been received via France to the effect that the rebellion in New Caledonia had been subdued. Prices here are steady at \$1.05 @ \$1.30.

Antimony.—Is moderately active and firm at 12¢ @ 12½¢. London remains unaltered.

OLD METALS, PAPER STOCK, &c.

There is still a good inquiry for Brass, Composition and Lead. Iron is dull and declining with stocks accumulating. Copper is also very quiet. There is not a very large supply in dealers' hands, though it is in excess of the demand. Paper stock has been moving freely during the week, and dealers have disposed of a considerable portion of their accumulations. Other stocks present no material change.

The purchasing prices offered by dealers for Old Metals are as follows:

Copper, heavy.....	per lb. \$0.13	@
Copper Bottoms.....	"	10½
Yellow Metal.....	"	10
Brass, heavy.....	"	9
Brass, light.....	"	8
Composition, heavy.....	"	11½
Lead, solid.....	"	10½
Pewter, No. 1.....	"	9
Pewter, No. 2.....	"	8
Wrought Iron.....	pr ton \$16.00	@
Light.....	"	8
Store Plate.....	"	11.00
Machinery do.....	"	11.00
Grate Bars.....	"	3.10

The prices current for Rags, &c., are as follows:

Canvas, linen.....	per lb. 3 c. @ 3½ c.
" Cotton, No. 1.....	" 3½ c. @ 3½ c.
" No. 2.....	" 1½ c. @ 1½ c.

White, No. 1.....	3½ c. @ 3½ c.
" No. 2.....	" 3 c. @ 3 c.
Seconds.....	" 2 c. @ 2 c.
Mixed, Woolen.....	" 2 c. @ 2 c.
Soft, do.....	" 6½ c. @ 7 c.
Gunny bagging.....	" 3 c. @ 3 c.
Jute butts.....	" 3 c. @ 3 c.
Kentucky bagging.....	" 2½ c. @ 2½ c.
Book Stock.....	" 1 c. @ 1 c.
Newspaper Stock.....	" 1 c. @ 1 c.
Waste Paper and Scraps.....	" 1 c. @ 1 c.
Kentucky Bale Rope.....	" 4 c. @ 5 c.
Oakum Junk, No. 1.....	" 3 c. @ 3 c.
" No. 2.....	" 3 c. @ 3 c.
Tarred Shaking.....	" 1 c. @ 1 c.
Grass Rope.....	" 2½ c. @ 2½ c.

EXPORTS

Of Hardware, Iron, Machinery, Metals, &c., from the Port of New York, for the Week ending Sept. 17, 1878:

Bremen.		British North American Colonies.	
Quant. Value.		Quant. Value.	
Hdw., cs.,.....	33 \$1,046	Mf. iron, pkgs.,.....	64 \$1,018
Ag. imp., pkgs.....	6 775	Hdw., cs.,.....	1 65
Pld ware, cs.,.....	3 620	Shot, bxs.,.....	2 30
Mach'y, cs.,.....	3 870	Iron, pkgs.,.....	10 180
		C'ge mtl, pgs.,.....	20 913
Hull.		New Zealand.	
Hdw., cs.,.....	167 3,395	Hdw., pkgs.,.....	836 17,759
		Ag. imp., pkgs.....	52 730
Glasgow.			
Ag. imp., pkgs.,.....	1,138	Mf. iron, pkgs.,.....	125 970
Hdw., cs.,.....	16 720	Mach'y, pkgs.,.....	3 344
Mach'y, cs.,.....	18 1,814	C'ge mtl, pgs.,.....	183 2,725
Beltng, cs.,.....	2 750	Pld ware, cs.,.....	2 220
Hamburg.		British West Indies.	
Hdw., cs.,.....	76 2,485	Mf. iron, pkgs.,.....	14 122
Ag. imp., pkgs.,.....	11 810	Tinware, pkgs.,.....	10 163
Spelter, slabs, 24x22.....	9,800		
Mf. iron, pkgs.,.....	10 351	Cuba.	
Carbides, cs.,.....	3 350	Mf. iron, pkgs.,.....	196 1,400
Em'ly stns, lgs.,.....	2 200	Barrows.....	6 91
C'ge mtl, pgs.,.....	1,348	Trucks.....	24 4,800
Kn't mchls.,.....	10 1,440	Iron chns, bxs.,.....	2 314
Mach'y, cs.,.....	7 1,019	Brass g'ds, cs.,.....	6 140
		Beltng, cs.,.....	4 590
Liverpool.			
Handspikes.....	1165 500	Wire, pkgs.,.....	76 589
Hdw., cs.,.....	92 10,054	Grindstones.....	300 416
Ag. imp., pkgs.,.....	7,127	Copper, bbls.,.....	140 370
Mf. iron, pkgs.,.....	23 795	Hdw., cs.,.....	158 2,968
Mach'y, cs.,.....	4 983	Nails, kegs.,.....	799 2,464
Em'ly stns, lgs.,.....	2 200	Mach'y, pkgs.,.....	100 28,006
Ag. imp., pkgs.,.....	51 712	R.R. iron, bbls.,.....	133 4,776
Pld ware, cs.,.....	3 1,525	Wheels, pairs.,.....	112 2,546
Pumps, pkgs.,.....	2 78	Tinware, cs.,.....	3 109
		Pumps.....	2 4,000
London.			
Hdw., cs.,.....	715 4,542	R.R. mts, pgs.,.....	506 13,380
Mach'y, cs.,.....	92 10,054	Cars.....	2 100
Ag. imp., pkgs.,.....	19 1,086	Ag. imp., pkgs.,.....	1 90
Beltng, pkgs.,.....	2 895	Pld ware, cs.,.....	5 170
Mf. iron, pkgs.,.....	44 397		
C'ge mtl, pgs.,.....	33 700		
Pld ware, cs.,.....	6 347		
Bristol.		Porto Rico.	
Mach'y, cs.,.....	6 4,000	Ag. imp., pkgs.,.....	7 184
		C'ge mtl, pgs.,.....	13 171
		Iron safe.....	1 285
Marseilles.		Hayti.	
Coal, tons.,.....	80 320	Nails, kegs.,.....	24 59
Genoa.		United States of Colombia.	
Mach'y, pkgs.,.....	78 2,712	Mach'y, pkgs.,.....	78 2,712
Windmill.....	1 65	Cutlery, cs.,.....	131 4,818
Carb.....	2 300	Revolvers, cs.,.....	57 1,475
Coal, tons.,.....	125 500	Arms, cs.,.....	1,606 2,050
Havre.			
Ag. imp., pkgs.,.....	39 4,057	Iron, bars.....	149 8 1/2
Mf. iron, pkgs.,.....	14 970	Fin. bar mts.,.....	10 90
Guns, cs.,.....	3 325	Pump mts.,.....	133 3,300
Hdw., cs.,.....	1 130	Pumps, pkgs.,.....	3 8 1/2
Copper, cks.,.....	219 48,660	Cartridges, cs.,.....	13 42
French West Indies.			
Ag. imp., pkgs.,.....	5 73	Wire cloth, cs.,.....	1 142
		Pld ware, cs.,.....	1 142
Africa.			
Nails, kegs.,.....	20 53	Wire, cs.,.....	31 125
		Ag. imp., pkgs.,.....	4 6
C'ge mtl, pgs.,.....	21 275	Hdw., cs.,.....	90 2,538
		Tinware, cs.,.....	2 100
		Cutlery, cs.,.....	2 100
Venezuela.		China.	
Nails, kegs.,.....	20 53	Hdw., cs.,.....	1 65
Seville.			
Hdw., pkgs.,.....	55 1,160		

(Borsenhalle.)

HAMBURG, Aug. 31, 1898.—*Metals*.—This has been a dull week, and we approach the fall season with a feeling of gloom, and no one is northward, considering the fact that the elements underlying the general metal situation are essentially sound. *Copper*.—The German markets have been quiet for the first time in several months. The price of Berlin has shown little animation. They quote good qualities English and Australian 70 @ 73.50, and Mansfield, 73 @ 73.50 marks the 50 kilos. There are no other quotations. *Iron*.—The market is very poor. Roosaars, in rosettes, 75 marks; American Lake, 85; and Tough Cake, 69 @ 70. A dispatch from St. Petersburg quotes Copper there at 73 @ 77.75. *Steel*.—The market is very dull. They quote 50 kilos Banca 70 @ 70.50 marks the 50 kilos, and English Refined, 67.50 @ 68. We are unaltered here and quote: Banca, 71 @ 72; and Refined, 72 marks the 50 kilos. *Gold*.—The market has fallen into a dull mood. Berlin quotes Tarnowitz, Hartz and Saxonia 16.60 @ 17 marks the 50 kilos. We quote English *Bar* here 15.50 @ 16; Sheet, ditto, 15 @ 15.50; German *Bar*, 15.50 @ 16; Spanish, 20 @ 21; and other brands, 18.50. *Spelter*.—The absence of stock at the centers of distribution prevents transactions of any magnitude for the present. Berlin quotes Düsseldorf 15.50 marks the 50 kilos. Breslau quotes Hohenlohe 17.50. We are here nominally 15.50, both spot and to arrive.

HOLLAND.

ROTTERDAM, Sept. 4, 1878.—Tin.—Banca has moved off satisfactorily, the price has, however, been declining, and from 30.25 guilders the 50 kilos. at the commencement of August, has gradually given way to 28. Contracts for delivery ex. July sale changed hands at from 29 to 32.25. In Bill-ton a considerable business has been done during the month, chiefly for covering previously made sales to arrive. The price declined from 37 to 35. Buyers having replenished stocks they are not likely to resume operations till this can be done on still more favorable terms.

EAST INDIES.

(Schmidt & Kustermann.)

PEKAN, July 22, 1878.—Tin.—The market opened at \$17.70 per picul, with an active demand for England, America and China, and prices gradually advanced in consequence to \$17.85 shortly afterward. Supplies have since remained moderate, and fresh supplies were rapidly taken up for China and India at \$17.85 @ \$17.85, closing at \$17.95, although the demand for Europe has slightly fallen off. **Tonnage.**—There is no material change to be noticed; available tonnage keeps rather in excess of the demand. **Exchange.**—The sterling rate followed at first a downward tendency, closing on departure of last mail at 3/10½ for six months' sight bank paper. Since then an advance has been established and the banks are now drawing at 3/11. (Gillilan, Wood & Co.)

SINGAPORE, July 27, 1878.—Tin.—There has been a decided drop, the last supplies having been sold with difficulty at \$18.25 per picul. Even this price would not have been made but for the improvement in the demand for China. The steamer *Glanis Castle* has about 200 tons engaged, but she cannot get away for ten days yet, so this month's exports will be small.

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From our Regular Correspondent.)

LONDON, ENG., Sept. 3, 1878.

THE OUTLOOK

is not generally very promising just now, the past ten days having been characterized by a notable feeling of depression in almost every branch of business. The fact is people become tired of waiting, struggling and hoping for the long-debated and much-prayed-for revival, and every now and then they "throw up the sponge" and retire into despondent corners, figuratively speaking, whence the force of circumstances and the necessary accidents of commercial existence speedily dislodge them. Just such an abandonment is now in force in many parts of the country. With some manufacturers and other classes of traders the case is desperate, and unless there should be a change upward we shall, I expect, have a further crop of failures. All the evidence we have before us demonstrates that the production is still largely outside the wants of the market; that stocks are growing even though more than half the blast furnaces are standing idle, and that there is a keener competition than ever in the great buying countries. Protectionist tariffs and the development of foreign industries are steadily limiting the area in which we may look for users of our manufactures, so that with these limitations in progress externally and an enormous extra production, it is no longer a matter for surprise that our iron and steel works are idle, and that our commercial men deplore the evil times which have befallen them.

THE REMEDY

for all this is at hand, but like your Western tramps "they go about seeking, yet praying heaven they may not find it." Where the facts are so plain it scarcely ought to need a detailed demonstration of the process of cure. The remedy is, in its narrowed and concentrated issues, a violent one—being neither more nor less than that a certain number of producers should be eliminated out of the trade. This purgation cannot be accomplished either by persuasion, argument or legislation, but by the stern and unyielding logic of facts it must come about—indeed the process of disintegration has for some time past been in operation. Those who threw their capital into the British coal, iron and steel trades or their collateral industries in the early part of the present decade, did so at a peculiarly bad time and under exceptional disadvantages. Everything they needed for their works and plant—from bricks and mortar upward—was then selling at abnormal prices; hence it followed that a colliery which would ordinarily have cost £50,000 then involved the outlay of £150,000, or even more, and iron works, &c., were only to be created by a proportionately heavy expenditure. Under such circumstances the dead charges must inevitably be prohibitive with selling prices at an ordinary level, and nothing but a further and larger reserve of capital could keep things moving at all. The long period of dullness that has since prevailed has tested these concerns most severely. Their reserve capital has mostly "given out," and despite frequent reductions of wages and other more or less justifiable expedients, their condition is at present utterly desperate and hopeless.

THE CHAMBERS OF COMMERCE

have been discussing a variety of subjects of much interest at their associated gathering at Sheffield. As you have not space for a detailed report of the proceedings, I shall only call attention to their discussion on the subject of the decline of British foreign trade and to the way in which several of the true causes of the existing depression were ably shelved. If my memory serves me rightly, not one of the speakers ventured to hint that the undue and unwise expansion of the home trade was the prime cause of the collapse, and a large minority fought shy of Mr. F. Brittain's proposal for a royal commission to inquire fully and thoroughly into the matter. One remark, accredited to Mr. Mundella, M. P., amused me immensely. That gentleman advised the assembled delegates "to be careful what they might say on the subject of free trade, otherwise they would have every American newspaper from one end of the States to the other quoting their remarks as evidence against the free trade they once so warmly advocated." O tempora! O mores! O Mundella! this is really too bad. Why this unnecessary severity! Surely, my friend, free trade is strong enough to take care of itself and to outlive the calumnious slander of the heretic and heterodox Americans!

Yes, yes, the truth is mighty and must prevail! As to which is and which isn't truth I cannot say. We pay our money, but it does not appear that we have our choice. Trade is not so accommodating as the showman, and we have to buy results by experience, which is often severe and bitter, as Mr. Mundella, *inter alia*, well knows.

SCOTCH PIG IRON

has been weak, with a decline of some pence in the quotations for warrants. At the time of writing there are 197,604 tons of pig iron in Connal's Glasgow stores, as against 157,222 tons same date last year. The furnaces in blast number 96, whereas there were 87 twelve months ago—a fact which would seem to indicate an improved state of business were we not aware how large the stocks are in first and second hands, not to mention the significant circumstance that the ironmasters have now notified a further general reduction in the wages of their workpeople. Ballast pig averages 42/6 per ton alongside either in the Clyde or Forth, and freights are at their previous low ebb. Writing from Glasgow on Aug. 31, James Watson & Co. said: "The Scotch pig iron market has been flat during the past week, prices ranging from 48/7½ to 48/3, cash, closing this afternoon with sellers at 48/3, cash, and 48/6, one month, buyers one penny less. Shipments last week were 8700 tons, as compared with 8480 tons for the corresponding week of 1877. We quote:

G. M. B. at Glasgow	No. 1.	No. 3.
Gartsherrie, "	48/	48/
Coltness, "	48/6	48/3
Summerlee, "	48/6	48/3
Langloan, "	48/6	48/3
Carnbroe, "	48/9	48/
Calder, at Port Dundas, "	48/	48/
Glenarnock, "	48/	48/
Edlington, at Ardrossan, "	48/	48/
Dalmellington, "	48/	48/
Shotts, at Leith, "	48/6	48/6
Kinnell, at Boness, "	48/	48/

Last week's shipments of manufactured iron, &c., from the leading Clyde ports were very considerable, the machinery alone being valued at over £17,000, the castings at about £20,000, and miscellaneous lots at half as much more. The leading items in the list read as under: From Glasgow, St. Johns, Quebec and Montreal, 21¼ tons wrought-iron tube, £286; 168¼ tons iron castings, £925; sewing machines, £360; 1 ton wrought iron, £18; Mediterranean—Machinery, £3; 19½ tons iron castings, £1102; sewing machines, £4142; 31½ tons wrought-iron tubes and fittings, £319; 10¼ tons iron plates, £82; ¾ ton iron and steel manufactures, £35; Halifax, N. S., and St. John, N. B.—1¼ tons iron castings, £12; ½ ton iron chains, £14; 11¼ tons bar iron, £779; 20¼ tons wrought-iron tubes, £267. Rio de Janeiro—213½ tons iron castings, £11,847; agricultural machinery, £3390. Santos—13¼ tons wrought-iron tube, £122; 57½ tons cast sleepers, £252; Demerara—12½ tons iron castings, £130; 4¼ tons wrought-iron work, £95; galvanized iron buckets, £20; sugar-making machinery, £355; Calcutta—Machinery, £13,191; 7¼ tons iron castings, £60; Malaga and Seville—75½ tons iron castings, £350; Lisbon and Huelva—33¼ tons cast iron, £150; 34 tons bar iron, £210; Nickerie—Cast-iron nails, £19; 4½ tons iron castings, £122; machinery, £240; Alexandria and Cyprus—5¼ tons iron castings, £97. The amount of manufactured iron exported from Glasgow last week was: Bar, 162½ tons; plate, 10¼ tons; wrought, 79¼ tons; total, 252 tons; same period last year, 424¼ tons. From Greenock—St. Johns, N. F.—Hoop iron, £6; 11 tons wrought iron pipe, £65; iron nails, £17; iron castings, £35; bar iron, £31. From Grangemouth—Rotterdam—Iron castings, 5 tons and 80, one case machinery, £10, and other descriptions; Amsterdam—Iron pipes, £100.

IN CLEVELAND

there would appear to be some little movement in the right direction, several of the works being rather busier than they had been for a long time previously. Vendors of pigs are holding out for more money, but, on the whole, they are understood not to be able to secure the additional impost they desire. Bolekow, Vaughan & Co. are doing well at their grand Eston establishment, and are bringing home a heavy importation of ore from Bilbao for the use of their furnaces. Their rail mills are fully engaged, and are likely to remain so, judging by the present state of the company's order books.

FROM SHEFFIELD

a not very hopeful report is forthcoming, but in spite of the current gloominess the leading spirits of the Bessemer trade are busy, and in one notable instance, that of Brown, Bayley & Dixon, a couple of additional 6-ton converters are being erected. Mr. Holland, the head of this great concern, is fully abreast of his contemporaries, and with coal and iron all around him, thinks he can run a very close second even with Bolekow's. Cammell's are rolling rails, wire, &c., for Russia, and John Brown's are doing a very heavy line in Bessemer sheets and plates, in the production of which they are utilizing a tremendous accumulation of old scrap iron and about their premises. The Phoenix, Stockbridge, and Dronfield works are fairly well engaged, Samuel Fox's, Stockbridge, being quite unapproachable in some of the rolled and drawn steels which they make their specialties. To say more would be to betray secrets. Firth's are not, I hear, doing much in their steel departments, nor can Sanderson's or Jessops' be described as being at all well engaged. In files and edge tools, however, there is a very fair amount of work on hand, some of the tool manufacturers, in fact, being well employed. The larger cutlery firms are doing a moderately steady turnover, but the smaller houses have good reasons for their complaints.

STAFFORDSHIRE AND BIRMINGHAM

are not very strong either in respect of prices or as regards the amount of actual business in manufactured and merchant iron. Sheets, however, are in pretty good request, and at one or two of the principal galvanizing establishments the call is decidedly well sustained, although latest Australian and New Zealand advices report those markets dull and somewhat over-supplied. Mr. Lysaght, one of these manufacturers, is enabled to keep five out of his six mills at work. In all branches, nevertheless, prices have a decided tendency to rule

in favor of buyers, albeit marked bars remain on the official list basis of £8. 10/. Any quantity of good iron of that class, nevertheless, can be bought at £6 @ £6. 10/ per ton. Earl Dudley and Messrs. Barrows are the principal exceptions to this rule, their works being pretty well engaged on government orders. The larger engineering, tool making and hardware establishments of old Brun, Dudley, Wolverhampton and other chief centers of the Black country are tolerably well "fixed," special machinery being in considerably improved request for certain of the foreign as well as for the home markets.

AMERICAN TUBES

are said to be on offer in Staffordshire at "any prices" under those of the honest producers, which is creditable to the energy of your manufacturers, although admittedly an extremely novel way of doing business. In case the fact is correct it would appear to open up a fine field for ingenious purchasers to play off the home and American vendors against each other.

THE TERRIBLE ACCIDENT

on the Chatham and Dover line on Saturday once more comes to remind us that in this enlightened country the railway companies are above and defy the law. This train was running without any continuous brakes, and the shunting was being transacted by means of hand switches instead of by means of safety interlocking points and signals. The vehicles, too, were so light that they crumbled up to match wood, although the engine was hardly at all damaged. The Pullmans were wanted here.

THE WESTINGHOUSE BRAKE,

too, was wanted, and all would then have been well. Knowing what I do, and seeing what I see daily, I am surprised that the enormous passenger traffic of the city and suburbs is not attended with more slaughter than that which actually occurs. The railway companies south of the Thames are the "ornariest consarns" going; and although the cockneys claim to be the very salt of the earth, they are compelled to submit to be boxed up in effete old contrivances, yclept carriages, against which the meanest artisan of the manufacturing districts would rebel. North of the Thames these remarks don't apply—there the service is ahead of all the world by very long chalks.

SOUTH WALES AND MONMOUTHSHIRE.

A slightly better tone is reported from South Wales, where some buoyancy is to be attributed to the reported vigorous preparations for resuming operations at Cyfarthfa. Among the shipments last week—total 156 tons—from Cardiff was one of 750 tons of bar from Dowlais for New York; another of 70 tons of wire to New York from Messrs. Edwards & Co., and a third of 350 tons tin (plate) for New York from Mr. Edwards. In the Swansea district tin plates are reported to be in better request and to command rather more money. The imports of Spanish ore into Newport reached 7044 tons.

THE METAL MARKETS

have not on the whole improved in any appreciable degree, as is evinced by the subjoined weekly report of the *Ironmonger*: "Copper remains steady and unchanged. About 250 tons Chili bars have sold at £61. 5/ for good ordinary brands spot; £61. 15/ for special brands spot, and £62. 5/ for three months' prompt good ordinary brands. A cargo of New Quebrada ore has sold at 11/7½ per unit for 14 per cent. produce. Wallaroo is quoted £70 and Burra £69. Tin is lower. Considerable business has been done at £59 @ £58. 15/ for Straits and Australian on the spot. English ingots, £63. 10/. Tin plates are in fair request, but prices are extremely low. The American demand has of late become rather stronger, but even when this is taken into consideration the production at the works in South Wales is materially in excess of the market requirements. Lead is unchanged since last report. English pig, £16. 5/ @ £16. 12/6. Spanish, without silver, £16 @ £16. 2/6. Spelter—Ordinary brands remain at £18. Zinc is somewhat lower at £20. 5/ @ £20. 7/6. Quicksilver has sold at £7 and Antimony at £49 @ £50."

The official report of the London Lombard Exchange says: "Copper steady at £61. 5/ for G. O. B. and £61. 10/ @ £61. 12/6 for named brands; Wallaroo, £70; Burra, £69; English tough, £66. 10/ @ £67. 10/; best selected, £67. 10/ @ £69; strong sheets, £72. Tin.—Transactions reported in Straits and Australian at £58. 10/ @ £58. 12/6; English ingots, £63. 10/. Lead—Dull; English pig, £16. 2/6 @ £16. 10/; soft Spanish, without silver, £16 @ £16. 2/6. Spelter.—£13 for ordinary brands. Zinc—No quotations. Quicksilver £7. Antimony £49 @ £50."

The Inventor of Gas Lights.—The inventor of gas lights is said to have been a Frenchman, Philippe le Bon, an engineer of roads and bridges, who in 1772 adopted the idea of using for the purpose of illumination the gases distilled during the combustion of wood. He labored for a long time in the attempt to perfect his crude invention, and it was not till 1799 that he confided his discovery to the Institute. In September, 1800, he took out a patent, and in 1801 he published a memorial containing the result of his researches. Le Bon commenced by distilling wood, in order to obtain from it gas, oil, pitch and pyroligneous acid; but his work indicated the possibility of obtaining gas by distillation from fatty or oily substances. From 1799 to 1802 Le Bon made numerous experiments. He established at Havre his first thermo-lamps; but the gas which he obtained, being a mixture of carbureted hydrogen and oxide of carbon but imperfectly freed from its impurities, gave only a feeble light and involved an insupportable odor, and the result was that but little favor was shown to the new discovery; the inventor eventually died, ruined by his experiments. The English soon put in practice the crude idea of Le Bon. In 1804, one Winsor patented and claimed the credit of inventing the process of lighting by gas. In 1805 several shops in Birmingham were illuminated by gas manufactured by the process of Winsor and Murdoch. Among those who first used this new light was Watt, the inventor of the steam engine. In 1816 the first use of gas

was made in London, and it was not until 1818 that this invention, really of French origin, was applied in France.

Barff's Process for Protecting Iron against Corrosion.

Prof. Barff, the well-known inventor of a new method for protecting iron against corrosion, has recently given a more detailed description of his apparatus than has hitherto been published, in a paper read at the conference of architects in London. The following abstract of the paper embodies a short summary of the theoretical points involved, and a full description of the apparatus used and the effect the process has upon different kinds of iron:

Iron decomposes water or steam at a high temperature, i. e., at a red heat; all the oxygen of the steam unites with the iron and all the hydrogen is set free. If the steam be in the saturated state when the iron is submitted to its action I discovered that the oxide formed does not adhere firmly to the iron, but if the steam be superheated or dry the oxide does adhere very closely to the iron. In this case it seems that the moist steam first forms the red oxide of iron, and this is reduced—by the hydrogen set free—to the metallic state, and it is in a state of fine division; and this finely divided iron is then by fresh steam converted into the black oxide. Having passed through these changes it will manifestly have lost its bond, and although it adheres for a short time, it is before long thrown off; rusting is then set upon the surface which it covered. The first action of oxygen on iron is to form the ferrous oxide, and this gets converted rapidly into ferric oxide. Now, imagine the surface of a piece of iron in moist air to be thus coated, it will not be difficult to understand that the entire oxygen which this ferrous oxide takes up to become ferric oxide is passed on to the iron beneath it, forming with it ferrous oxide, and that the first ferrous oxide formed takes up more oxygen and becomes ferric oxide again. This process goes on continuously till all the iron is in time converted into ferric oxide. The ferrous oxide then acts as a carrier of oxygen to the iron, causing it to be changed throughout its mass into oxide. A piece of perfectly dry, clean iron will not oxidize in dry air. Moisture is necessary to cause the oxygen of the air to unite with it; and whenever iron is exposed to moisture ferric or red oxide of iron is the result. But when iron is burned in dry air or oxygen this red oxide is not formed; the black oxide is produced. If, however, an experiment be carefully performed to illustrate this, if the air or oxygen be not dry, then some red oxide will be formed along with the black. The black magnetic oxide of iron is not affected by oxygen in the presence of moisture, and thus it affords a protection to the iron upon which it is formed.

The apparatus I now employ consists, first, of an ordinary boiler, in which steam is generated, usually at a pressure of 40 pounds to the inch. My boiler is a very strong one, as it is adapted to other experiments; one which is safe at 40 pounds pressure is sufficiently strong for this work. From the boiler the steam passes into a tight iron box, where it parts with some of its moisture, for the steam is saturated; from this box it passes into the superheater at its original pressure. The superheater consists of two stacks of pipe placed in a furnace parallel with one another, with a space of about 15 inches between them. These stacks are supported on dwarf walls of fire-brick, and are connected together so that the steam traverses the whole length of all the pipes, which is about 36 feet. The pipes are 1½-inch bore, and are kept at red heat, or even at a higher temperature; the steam in its passage through them becomes superheated, and when it issues from the end it will set fire to wood. The end of the superheater pipe is connected with the back of a chamber built of fire-bricks; this chamber is 5 feet long, 2 feet 6 inches wide, and 1 foot 6 inches high, arched at the top. Beneath it is a fire-place, and up its sides flues pass, so as to ensure its being uniformly heated; it is closed with an iron door, faced with fire-tiles 1¼ inch thick, which is easily raised by a balanced weight. When it is closed, to work the process the fire is lighted beneath the chamber, and it is heated to a temperature of about 700° or 800° F. All this time the superheater is being raised to a proper temperature—that is, to a cherry-red heat, and the steam is got up to 40 pounds in the boiler. The chamber is then opened; the iron articles are then placed in it, and kept there till the temperature rises again to from 700° to 800° F. The door is then gently, not with the full force, that it has at a pressure of 40 pounds. The great object is to keep the chamber full of steam during the operation, and to effect this a slight, but a very slight, pressure is kept up; this is effected by having 7-8ths inch pipe placed at the upper part of the point of the chamber, close to the door. This pipe rises for about 2 feet 6 inches vertically, and then bends down to beneath the fire-place of the superheater, where it discharges excess of steam and the hydrogen evolved in the operation. At the top of this exit pipe, before it begins to bend, a valve is placed, suitably weighted, to prevent undue pressure in the chamber.

I have now described the apparatus I use, but other and more simple appliances would be sufficient. The reason I use this more complicated apparatus is because I have other matters in hand connected with superheated steam. My present superheater is large enough to supply a chamber ten times the size of the existing one. A very good and simple form of superheater is made by bending a 7-8ths pipe backward and forward four times to the length of 2 feet or 2 feet 6 inches, and then embedding the coil so formed in cast iron. Several of these can be joined together; they can be easily arranged in any existing furnace, and can be supplied with steam from an ordinary boiler. In this way an apparatus can be put up at a small cost.

And now a few words as to the material to be treated. Cast iron requires a higher temperature and longer exposure, as a rule, than wrought iron; but here a certain amount of experience has to be acquired by

practice, and this is very easily done by a careful workman. Thin articles want but a short exposure, for by too long action they can be oxidized almost throughout their mass. In heavy articles it was found that after a time the action becomes much slower and at last almost ceases; this is due to the fact that hydrogen ceases to be evolved. The coating formed seals up the iron and prevents its coming in contact with the steam. Some sorts of cast iron are more easily and more uniformly acted upon than others; the inferior kinds, from the presence, I imagine, of carbon in the free state, do not present a homogeneous surface to the steam, and this causes a certain irregularity in the perfection of the coating. I do not think that this is of consequence in large articles, for even if red rust be formed in places its extent will be but trifling, and the rust will not spread, as I have abundantly proved by many experiments. Steel requires considerable care in its treatment; it should not be made too hot before the superheated steam is turned on—otherwise it is apt to scale. An initial temperature of between 500° and 600° Fah. is quite sufficient, and the steam should be allowed to enter the chamber in not too great volume, but very steadily and completely. It has all along struck me that the operation could be carried on with superheated steam alone without any auxiliary heat. The advantage of this will be manifest to the chemist, for the decomposition of steam by iron begins at a definite temperature, and therefore if steam alone be used the iron cannot get too hot before it begins to reduce or take oxygen from the steam.

Carbon Bronze.—Various forms of anti-friction metals of greater or less merit are offered the trade almost every day. Most of these are of but few days, while not many ever have any reputation outside of a very limited territory. The so-called carbon bronze seems to have a different history. Its success appears to be a matter of no doubt, and it is spoken of as a safe, durable and pure anti-friction metal. Its basis is copper, but from this metal various substances should be eliminated in order to ensure its purity. For the past five years it has been fairly tested, and has proved all that its inventor has ever claimed for it. We have already in a note referred to the fact that Krupp, the celebrated German ironmaster, has given a sample order. As proof of permanence and stability attention is called to a set of bearings of this material which have been in constant use for the past four and a half years in Lucy Furnace coke car No. 9. Carbon bronze costs but little more per pound than ordinary rod brass, and is from three to five times more durable. It is therefore at least 50 per cent. cheaper than other metal now in use for journal bearings. This metal is solely manufactured by the Carbon Bronze Company, Limited, at their metal refining works, Twenty-eighth and Railroad streets, Pittsburgh.

The Ferrie System at the Norton Furnace.—In the issue of *The Iron Age* of Sept. 5, 1878, we published a statement from the Greenup (Ky.) *Independent*, referring to the failure of the Ferrie system at the Norton Furnace. We have since learned that the information upon which this statement was based was erroneous and the conclusions arrived at incorrect, as the Ferrie system was in reality not submitted to any test in the furnace alluded to. The heavy fire-brick arches across the furnace, 46 feet above the hearth, melted away in the first 10 days of its working, when it was running on coke alone. The arches were constructed of the common Ohio River fire-clay, instead of being made as the instructions were, of the clays from the top of the Alleghanies.

Glass Industrial Items.—On the 29th ult. the first heat after the summer suspension was blown at one of R. C. Schmertz & Co.'s glass furnaces at Bellevue. A new furnace is about completed at the upper factory, in which fire will be placed some time this month.—The Berkshire Glass Works of Page, Harding & Co. are busy now running two furnaces, one on cathedral glass, of which they are turning out over 60 tints, they being the only establishment in the country making these goods. The window-glass furnace is a new one, built on the French model with some improvements.

F. Osann, of Dueseldorf, Germany, has patented a carbon lining for Bessemer converters and open-hearth steel furnaces, with the object of rendering possible the use of raw materials high in phosphorus. He claims that the reason why it has been impossible to eliminate phosphorus in the modern steel processes is the acidity of the slag, caused by the presence of a highly silicious lining, and that by replacing it by a carbon lining a more basic slag is obtained, which permits a more complete elimination of phosphorus. After having removed the greater part of the carbon in the pig in one of the improved apparatus, he proposes to tap the fluid metal, carry it to an ordinary converter or furnace and finish the operation there. The carbon lining is made of a dry mixture of powdered coke, fine graphite from gas retorts and dry asphalt. This mixture is moistened with petroleum oil and then stamped into the converter in the ordinary manner.

As will be seen from a special notice on page 20, the Richmond Architectural Iron Works, at Richmond, Va., are offered for sale or lease. The works, which were built 20 years ago, have recently undergone extensive improvements and are well supplied with all appliances, machinery and patterns, which an extensive trade calls for. The cupola is a No. 5 of the well-known McKenzie pattern, worked with a Sturtevant fan. The machinery and real estate, centrally located, are to be sold separately if required, so that purchasers have every opportunity to secure an outfit on favorable terms.

The ammonia of the commercial fertilizers manufactured in the suburbs of Augusta, Georgia, is said to have completely driven out the chills and fever and other malaria that used to infest that locality.

INDUSTRIAL ITEMS.

NEW HAMPSHIRE.

The Nashua Iron and Steel Co. are having made a three-high blooming train for working Siemens-Martin steel. The rolls are 23 inches in diameter, and are being made by A. Garrison & Co., Pittsburgh, Pa.

CONNECTICUT.

The Oneida Community at Wallingford are building additions to their works for the manufacture of spoons. A pile driver has been lately engaged in making a secure foundation for the heavy drop presses.

MASSACHUSETTS.

The contract for the steam heating and ventilating apparatus for the State Capitol at Indianapolis, Ind., has been awarded to the Walworth Manufacturing Co., of Boston; amount about \$50,000.

NEW YORK.

The Raritan Woolen Mill is to replace three 60-horse-power flue boilers by three 60-horse-power boilers of Babcock & Wilcox make, which will occupy the same space.

The new flour and saw mill at Coopers-town is to be run by a pair of 75-horse-power Babcock & Wilcox boilers.

Fletcher Furnace has gone out of blast for repairs, and every furnace in Buffalo is now cold. A new hearth and bosh are being made for the Fletcher at the Buffalo Fire-Brick Works, and as soon as they can be put in operations will at once be resumed.

Hubbell & Brother, stove manufacturers, Buffalo, have filed a petition in voluntary bankruptcy. No statement has yet been made, but a meeting of creditors will be called at an early date. The failure is due to the long-continued depression of business and the difficulty of realizing upon real estate assets. We trust that matters will be arranged in such a shape that the business can be continued.—*Buffalo Courier.*

PENNSYLVANIA.

The material for the new iron Lebanon Valley Railroad bridge at Reading has been completed by the Phoenix Iron Company, but it will not be shipped until so ordered by the Reading Railroad Company. It is to take the place of a temporary trestle bridge which has been in use since the burning of the original bridge during the July riots.

The Riehle Bros. (Philadelphia Scale Works) have just completed a newly-designed duplex spring testing machine, built for the Pennsylvania Railroad Company for the purpose of testing car and other springs. It is worked with a hydraulic pump in connection with regular scale mechanism scaled to the United States standard weight. Its maximum capacity is 50,000 pounds, and is provided with two tables so that two springs can be tested at once for compression.

The Pennsylvania Steel Works are working to their full capacity. A handsome brick building for machine and blacksmith shops approaches completion. The new and large steel house is to be put in operation as soon as it can be made ready, thus largely increasing the capacity of the plant. We hear that two blast furnaces are to have help in manufacturing Bessemer pig iron, one of the Paxton furnaces having been put in this service.

The old stack at the Paxton Furnace is to be put in blast at once to manufacture pig iron for mills belonging to the proprietor, the new stack running, as before noticed, on Bessemer pig iron for the steel works of Baldwin. The Paxton Rolling Mill is working day and night with orders to plate iron that keep the machinery busy and the men crowded to their last efforts to fill.

The Lochiel Iron Works are silent and dismal, illustrating the fate of many other establishments built to manufacture the now condemned iron rail. One of the blast furnaces is in operation and working on old cinder buried years since in the palmy days of the iron industry, when the Lochiel Works must have been a "big bonanza."

At the Chesapeake Nail Works all are busy. A new and improved building has been put up in place of the one demolished by the boiler explosion in June last, and enlargements and improvements in other buildings have been made.

The Pierce Well-boring Co., of Philadelphia, are engaged boring wells in different parts of the country and Australia.

The Philadelphia Smelting Co. are very busily engaged, having some extensive orders on hand.

George D. Rosebery, of the Pottsville Bolt and Spike Works, has been running double turn with two gangs of men, and has very extensive orders on hand for Cuba, Mexico and Canada. He purposes making a considerable addition to his already extensive establishment this fall.

Atkins Bros., of Pottsville, have been very busy for some time making beams and girders for the New York elevated railroads.

The Pennsylvania Diamond Drill Co., of Pottsville, Samuel E. Griscom, managing director, are busy making their patent rock drill. They are now attaching their patent "spiral grooved guide core barrel" to their drills, which allows the water to come up the grooves, and also keeps the drill perfectly straight and steady. They have several in operation in Australia and Venezuela, and have just received an order for one from an English company for prospecting purposes in Spain.

Messrs. Mellert & Co., West Reading Pipe and Machine Works, Reading, are very busy making gas and water pipes. They have several orders on hand for the patent Canada turbine wheel, of which they are the sole makers. They claim this wheel is the cheapest and most durable of any turbine now in operation, and that the average percentage of power is 80 per cent.

The Reading Hardware Co., Reading, are very busy on their various specialties, and have many very extensive orders on hand from foreign countries. This firm carries an immense line of builders' hardware and other goods, and can fill orders on shortest notice.

The Penn Hardware Co., Reading, are extremely busy on their various goods. They are just introducing a patent blotter and paper weight combined. Their specialties are frame pulleys, inkstands, &c., &c.

The D. K. Miller Lock Co., of Philadelphia, have just shipped a large lot of their

improved self-locking brass padlocks, ordered by a leading house in Australia. This is one of several shipments made since the Centennial Exhibition, and due to its influence. This company are continually making improvements and increasing their facilities in order to meet the demands for their locks, which are sold throughout the world. Among the foreign orders now on their books is one from an old house in Sheffield, England. To secure that market speaks well for this company and its workmanship.

The St. Charles Furnace at Columbia, owned by Messrs. C. B. Grubb & Sons, is to be remodeled by P. L. Weimer, of the Weimer Machine Works.

The employees in the Reading Railroad car shops, Reading, belonging to the coal, freight and saw gangs, will work nine hours a day henceforth, and next month, it is reported, they will work full time.

The Cambria Iron Company, Johnstown, are nearly ready to commence the manufacture of horse shoes, for which they have been preparing for some months. The shoe they will make is a newly-patented one, which was illustrated in *The Iron Age* some months since. The work will be under the charge of John R. Williams, formerly of the Burgess Iron and Steel Company, Portsmouth, Ohio. It is intended to erect only a small plant at the start, and afterward to increase it as occasion shall demand. At present they have in position a machine for bending the plate, a stamp for creasing, a punch and a hammer, together with the necessary furnaces and appurtenances. The peculiarity of the shoe they intend to make is an increase in the number of calks, two extra calks being placed on each side of the plate, thus securing a greater number of points for the support of the horse's hoof.

The agricultural works of James S. Marsh at Lewisburg were totally destroyed by fire last Saturday morning. Loss estimated at \$100,000; insurance, \$10,000.

The Johnstown Tribune of the 10th says: The blast furnace at East Conemaugh was started up again at 3 o'clock this morning, but the supply of water is barely sufficient to keep it running.

The Sheridan furnaces of Wm. Kaufman & Co. at Sheridan are making large shipments of pig iron to San Francisco, Cal., and also have shipped several lots to Montana Territory to be used for special purposes.

The rolling mill at Scottsdale resumed operations last week, and it and the blast furnace are now in full operation. The works had been stopped for several months.

The Maiden Creek Iron Works at Blandon, Berks county, have resumed operations, and are running double turn on gas strips and skelp iron.

For the week ending Saturday, September 7th, the Warwick Furnace at Pottstown made 353½ tons gray mill iron. The largest daily make was 55½ tons No. 2 Mill and the smallest 46 tons, when the furnace was stopped two hours. The ores yielded 45 per cent. in the furnace; and the consumption of fuel was 1.05½ tons or a little over 1½ tons. This is a record to be proud of. The furnace is anthracite, the size 55x16. Before the present manager, Mr. Edgar S. Cook, took charge the records of the workings of the furnace had been a series of failures. It now is doing unprecedented work.

The Glendower Iron Works at Danville, formerly owned by the defunct National Iron Company, and more widely known as the Rough and Ready Iron Works, were set on fire on the evening of the 10th, and the rolling mill damaged to the extent of \$2000. The works were to resume last Monday.

The Harrisburg Car Manufacturing began work on the 16th on a contract for 500 box cars for the New York, Lake Erie and Western Railway Company.

PITTSBURGH AND VICINITY.

The city council of Pittsburgh passed a resolution authorizing the trial of the Imboden and Porter, Bell & Co. street car motors on the street railroads of this city. The Mayor, however, vetoed the resolution and refused to sanction the experiments on the ground that they "might result in harm or injury to citizens or interfere with the rights or safety of the public." The resolutions were passed notwithstanding the Mayor's objection, and now the Imboden Vibrating Sub-motor Company, and Porter, Bell & Co. will at once make tests of steam engines on tracks of certain street railway companies in Pittsburgh.

The Pittsburgh Locomotive Works have made twice as many stationary engines and locomotives thus far this year as in any corresponding period since the panic, namely, 22 of the latter and about 50 of the former, 20 of the locomotives being for the Pittsburgh and Lake Erie Railroad, one for the Pittsburgh Southern and the other for the North Wisconsin. The majority of the stationary engines, which vary from 15 to 250-horse-power, were for the oil region. Some of the locomotives for the P. & L. road weigh 71,300 lbs., and one class (witch engines) weigh 69,000 lbs., the latter being the lightest of all. The average cost of each was \$9000. All have iron tender frames, balance valves and phosphor-bronze bearings. As the above-named works have built all the locomotives thus far ordered by the P. & L. E. road, it is presumable they will get the contract for the remainder. Large contracts are also expected from other quarters. The company employed 600 men before the panic; this year the average number of hands employed is about 300, a larger number than at any time since the panic.

Messrs. Phillips, Nimick & Co., of the Sligo Iron Works, are engaged in manufacturing plate iron for use in the United States Navy. Chief Engineer E. D. Robie has been ordered here to make tests of the same.

A. Garrison & Co., the well-known roll manufacturers, seem to have felt the hard times but slightly so far as relates to amount of work. They are running full time, and for months until recently, have been working 15 hours. Among the rolls now in hand they have at least a dozen from New England; others for St. Louis, Cleveland, Greenacres, Milwaukee, Columbus, Philadelphia, Waterbury, Conn., Northumberland, Pa., and other places, besides a large number for Pittsburgh. They make chills rolls from 4 inches to 31 inches in diameter, and 4 inches to 10 feet in length, and some

rolls up to 36 inches in diameter and 120 inches in length.

Porter, Bell & Co., light locomotives, have 120 men at work at present.

The stove foundries of Pittsburgh are all again in operation, with the exception of Herron's, which has not been in operation for some months. They are not, however, running very full as a general thing. The fall trade has been so late that some of the foundries had accumulated considerable stock. The total cessation of business in the Southwest by reason of the yellow fever will have a tendency to still further delay the trade and reduce it in amount, but the manufacturers, notwithstanding all this, look for a fair business.

The rolling mill at Brownsville has again resumed operations. The name of the firm operating it is Jones, Lewis & Co.

Hussey, Howe & Co., Pittsburgh, rolled last Wednesday two sheets of steel 33 feet long, 2½ feet wide and 3-16th of an inch thick, for the hull of a South American steamboat. These are the longest steel plates of that width and thickness that were ever rolled in Pittsburgh.

The locomotive works recently operated by W. H. Bailey, at Connellsville, are still unoccupied, though there is some talk of a company forming to resume operations soon.

Chalfant & Graff, of Edinburgh, have loaded on the cars a complete outfit of oil well supplies, with the exception of timber and lumber, to be shipped to York, Beaver county, Utah.

DELAWARE.

The Joseph Teas Co. of Wilmington, manufacturers of bolts, nuts, washers, wood screws, rivets, forgings of all kinds, truck axles, railroad frogs, switches, rods, bolts and irons for buildings are very busy on their specialties and have prospects of a good fall trade.

MARYLAND.

The American Coal Company of Lonaconing, Maryland, resumed shipment slowly by canal last week. Their coal is being principally sent by rail, owing to the high freight on vessels outward bound from Georgetown.

WEST VIRGINIA.

The stockholders of the La Belle Mill, Wheeling, have re-elected their old Board of Directors, viz: S. H. Woodward, C. B. Doty, David Spaulding, W. H. Wallace, S. O. Taylor, Thomas Harris, John Wright. Mr. S. H. Woodward was re-elected president of the board, and Mr. Joseph H. Woodward, secretary. The old managers in the mill were retained.

OHIO.

While the Union Steel Screw Company are running to their fullest capacity, it is not because of any increased consumptive demand. It is the low price at which screws are selling.

KENTUCKY.

The Greenup Independent of the 14th inst. says: The sale of the Buffalo Furnace property at Greenupsburg, was ordered by the Circuit Court, last week.

GEORGIA.

Messrs. E. L. Harper & Co., agents for the Cherokee Furnace, advise us that it has just started again on cold-blast car-wheel iron. The start was delayed very much beyond any expectation, but the delay was unavoidable.

American Planished Iron.

Mr. Edward P. White, a metal broker, sends us a copy of the following lithographed circular letter, with the request that we publish it:

RUSSIA SHEET IRON.

Gentlemen: The manufacturers of planished or "imitation" Russia sheet iron have distributed an extensively signed circular dated September 1st, 1878 (which *The Iron Age* of this city, in its issue of September 12th, has published, together with an editorial on the subject), directing attention to remarks said to have appeared in a circular or circulars issued by a New York broker or brokers. Inasmuch as they have been erroneously (except as hereinafter mentioned) attributed to me by many, I take this opportunity to say that the only remarks ever made by me in a circular in reference to imitation iron were on August 23d, 1878, and as follows, and after referring to the unexpected demand for genuine Russia: "It would seem as though after a trial of several years the imitation has been found wanting." My personal opinions, or those expressed by letter to my friends, are not called into question; therefore at this time it is not necessary to refer to them. I would simply say that I fully appreciate every real advance made by our manufacturers, but cannot shut my eyes to faults; and as the merits of the "imitation" as compared with the "genuine" has been started, I do not hesitate to say that the manufacturers of "imitation" have still before them the task (which I trust they will soon be able to overcome) of making an article that will stand the effect of different climates and not corrode easily.

A few years since I was informed by certain large Western jobbers that they would never want the "genuine" again, but there has been a heavy call from them and others this season for it, hence I attributed the extra demand to a discovery of fault above mentioned.

This demand has cleared the market unusually early of all light numbers. Another year we shall probably see a better supply, and I trust lower prices for both kinds, both genuine and imitation, and this state of things will probably gratify the party whose opinions have been so boldly expressed through the medium of the editorial referred to above. I remain, gentlemen,

Yours respectfully,

EDWARD P. WHITE, Broker.

NEW YORK, Sept. 14, 1878.

The concluding paragraph of Mr. White's circular, perhaps, calls for brief comment. We have only to say, however, that "the party whose opinions have been so boldly expressed through the medium of the editorial referred to above" is the editor of *The Iron Age*. Our knowledge of the facts led us to believe that Mr. White's statement respecting American planished iron was exaggerated, calculated to convey an impres-

sion not warranted by the experience of the trade, and intended to injure an industry which deserves well of all who admire enterprise and approve success worthily won.

The Siddeley & Mackay Ice Machine.

The rapid and uninterrupted increase in the consumption of ice, and the yearly additions to the number of industries so dependent upon a steady supply that short ice crops recurring periodically would seriously cripple them, has opened a wide field for ice machines. Their importance is, therefore, rapidly growing, especially as inventors, after long and expensive experiments, have learned to meet the difficulties involved and perfect the machinery to such a degree that artificial ice can now compete with natural ice. Of these machines the one patented by Messrs. Siddeley & Mackay, of Liverpool, has been most successfully used throughout Great Britain and her colonies. It has been recently introduced into this country by Mr. Geo. P. Armstrong, of 237 Broadway, as agent of the General Ice Factory Company, Limited, of London, England, a 5-ton plant being in full operation in this city.

The principle upon which the action of the machine is based is very simple. Ether boils under atmospheric pressure at 95° F., but with the aid of a vacuum pump vaporization takes place many degrees below the freezing point of water. When ether evaporates a large amount of heat becomes latent. The absorption of this heat from surrounding objects is made to decrease the temperature of a concentrated salt solution, which is chosen because it possesses the advantage of being non-freezable under the ordinary conditions affecting the working of the machine. A pump forces this cold brine solution through the hollow walls of cells which inclose the object to be frozen—in this case water. In order to be able to use the ether over again, it is condensed in a cooling apparatus, by which means the action becomes continuous, the sulphuric ether being evaporated uninterruptedly and passing into the condenser, from which the liquid is carried by pipes to an ordinary cooler and then to an ether meter which regulates the flow of the liquid ether to the refrigerator, and is so constructed that it makes the machine self-acting. The brine, too, is constantly and continuously in circulation; as the carrying medium it leaves the refrigerator, and in pipes passes through a series of tanks, freezing the water until it finally re-enters the refrigerator. The machinery is compact and occupies little space. It shows in its design an elaboration of detail and distribution of working parts which is the fruit of extended practical experience, and which proves that the machine is not an upstart making a sudden bid for public favor, but a construction destined to acquire in this country as prominent a position as it has already gained in England. The steam cylinder and vacuum pump cylinder are both horizontal and in one line. The brine pump and the fresh-water pump are also in line. The water which supplies the ether condenser is used afterward for the engine condenser, and then it goes to the feed pump of the boilers. Although its temperature is as high as 150° F., a vacuum of about 25 inches is maintained in the condenser.

The action of the process is the following: The ether evaporates in the refrigerator—a copper tubular vessel traversed by a large number of tubes through which brine circulates. The brine, at a temperature many degrees below the freezing point, is forced into a series of metal cells or chambers, of such shape that two adjacent ones inclose a space 4 feet by 4 feet by 9 inches. A number of these cells fill a tank, of which there are generally a sufficient number to represent about three times the producing power of the machine. Thus a 5-ton machine ought to have so large a number of tanks that their combined capacity is 15 tons. The brine is so circulated in the tanks that the coldest, freshest brine is conducted to the tanks where the greatest thickness of ice has already settled on the sides of the cells, the warmer brine being carried to water just commencing to cool down. In order to purify the ice, expel air and cool the water to a low temperature throughout the entire contents of the cell before freezing begins, agitators are allowed to stir it continually.

When the blocks are frozen solid they are loosened and readily removed by a very simple arrangement. The cold brine is first pumped out of the cells and replaced by brine of the ordinary temperature of the atmosphere. After the pump has been circulating this warm brine some little time, the ice will be found quite loose from the sides of the cells; it is then removed from the tank by means of a pair of blocks, the hook of which is inserted into a knotted looped rope which has been frozen into the block of ice. It is then carried overhead by a traveler, which delivers it either into the stores or into a conveyance for immediate removal.

The weight of each block when taken out of the tanks will range from 5 cwt. to 10 cwt., according to its size and thickness, but about 4 feet square by 9 inches thick, and weighing about 5½ cwt., is considered best for all practical purposes.

For a 5-ton plant a 10-horse-power engine is amply sufficient. The economy of power of the machinery and the arrangements for promoting rapid congelation are certainly such that the cost of production of one ton of ice is low, especially as it is claimed that only 15 per cent. of the amount of ether used is lost per annum.

In what is known as the Dunolly gold district of Victoria, a Chinaman working at a place called Jericho, found last June a nugget weighing 400 ounces. This extraordinary discovery drew many miners to the place, as might have been expected. The official reports for the quarter ending March 31 showed, however, that there had been a constant decline in the quantity of gold produced in Victoria. The total yield was 168,428 ounces, or a decline of 14,000 ounces as compared with the corresponding quarter of the previous year; while for the first half of the year 1878, exportations

showed a decline of 74,970 ounces. Meanwhile expeditions from Melbourne and Sidney continue to depart for New Guinea in search of the precious metal, and clamorings for the annexation to Great Britain of that portion of the island not in the possession of the Dutch, continue to be heard. A "Colonization League" has been formed in Melbourne having that object in view, and a petition to the Queen was recently prepared praying that this might be done.

The Wootton Coal Waste Burning Locomotive.

We have several times referred to the locomotive invented by Mr. John E. Wootton, of the Reading Railroad, for consuming anthracite coal slack. A trial has just been made on the Old Colony Railroad between Boston and Fall River. The trial was made with a train consisting of twenty-eight freight and two passenger cars and run from Boston to South Braintree, where the freight was detached and the party proceeded to Fall River. The exhibition was pronounced by the distinguished company of Massachusetts railway managers, directors and master mechanics a complete success. An effort will be made to place the locomotive on the Boston and Albany Railroad, and test its capabilities on the heavy grades among the Berkshire hills. The fuel used by this engine can be delivered in Boston at the present time at \$2.25 per ton, or \$1.50 less than the cost of fuel which is now used. As the fuel remains perfectly quiet in the fire-box the consumption is slow, and although the engine has no spark arrester, not a spark escapes from the stack, neither is there any annoyance from smoke and gas, which are consumed. Its construction insures complete protection from fire, as no coals drop out on the track and no sparks are blown from the smoke-stack. Economy in fuel, comfort to the traveler and security against burning bridges and woodlands will be secured by the adoption of this style of locomotive.

The Wheeler Process at the Paxton Mill.

A correspondent writing from Harrisburg, Pa., under date of Sept. 13, says: I have witnessed on two occasions at the Paxton Rolling Mill, Harrisburg, a method of rolling plates of combined iron and steel (Wheeler process) which for novelty of method, economy of treatment and unexpected certainty of result, is, I think, of special interest. There was no care taken in the preparation of the piles; such materials as happened to be at hand at the mill were used, and the services of such heaters and rollers as happened to be on duty were accepted as matters of course. The center of each pile was old steel rail rejected from the scrap heap, cut to a length of 2 feet and placed six pieces closely together, alternating tops and bottoms. These were laid between two pieces of 15-inch muck bar of common puddled iron, and confined by a plate of muck iron bent around the sides and ends. This crude box, made of pieces of metal disproportioned in size to the service, was brought to a welding heat in an ordinary reverberatory furnace, and without further aid rolled directly into steel yielding 35 square feet of 1¼-inch plate, perfectly sound, with good surface and of high tensile strength, available as tank or ship plate, and at a price without competition. One of the plates I saw rolled, and a duplicate of the pile will, it is expected, be on exhibition at the fair of the American Institute.

The Philadelphia Evening Bulletin gives a

detailed account of the Philadelphia and Reading Railroad Company's fleet of steam colliers and how their operations are carried on. The fleet now comprises 14 iron steamers, from 500 to 1650 tons carrying capacity (only four falling below 1025 tons), specially constructed for carrying coal. During 1878 they made 526 voyages, running 483,236 miles and carrying 602,496 tons of coal. From the first, 1869, the fleet has run over 2,000,000 miles, delivering 2,099,036 tons of coal. Some of these colliers have at times made trips to almost every port along the coast from Portland to Aspinwall, but the greater portion of the trade is with ports between New York and Portland. The average speed of the steamers is about 10 miles per hour. The Pottsville, it will be remembered, made a voyage to Havre last spring to take the exhibits of the Philadelphia and Reading Railroad Company for the Paris Exhibition. She made the run in 16 days, and her engines were never slowed or stopped during the trip. It was found that as a coal-carrying vessel she was much superior to the English colliers.

The cultivated land of France is held by 5,500,000 owners. Five millions do not own more than six acres each. A similar state of things exists in Belgium. But in Ireland one-fifth of the soil is held by 110 persons.

John Carver,

MANUFACTURER OF

CAULKING IRONS,

Cotton, Freight and Hay Hooks,

No. 288 Monroe Street,

Bet. Jackson & Corlies Sts., NEW YORK.

MACHINE MOULDED MILL CEARING.

AS ACCURATE AS CUT GEARING.

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Saves Time and Expensive Patterns,

SHAFTING, PULLEYS AND HANGERS,

A SPECIALTY,

LEFFEL TURBINE WATER WHEELS,

STEAM ENGINES AND BOILERS,

MIXERS FOR FERTILIZERS AND CHEMICALS.

POOLE & HUNT, Baltimore.



THE ROGERS SAW.

With Drilling Attachment and Iron Table,
Adjustable for Inlaying.

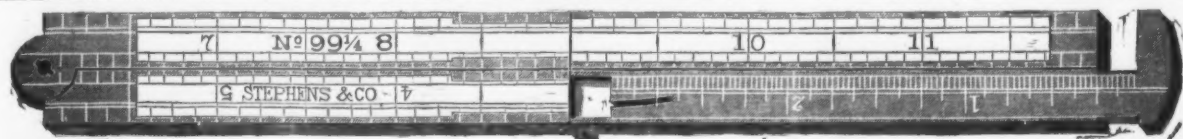
All the working parts of iron and steel. Weight, with box, 30 pounds.
Height of table above the floor, 32 inches; 12-inch belt wheel; 5 inch balance wheel; arms, 18 inches in the clear; latest improved clamps; round belts; extra drills and wrench.

The iron and steel parts are polished or japanned. The wood is painted dark.
It is not as good as our Lester Saw, but is much better than any other cheap machine in the market.

Price, including all the attachments and the box, \$3.00.

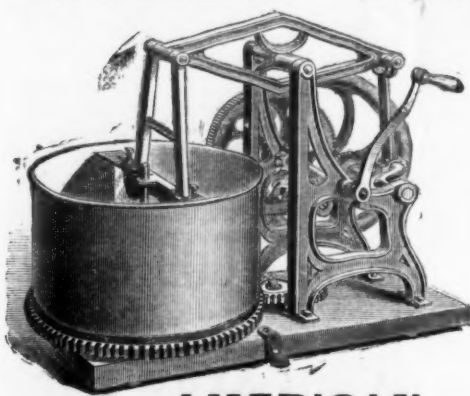
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Rules graduated in foreign measure to order. **RIVERTON, CONN.**
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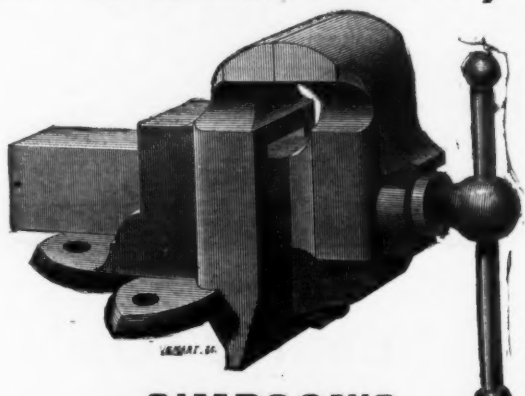
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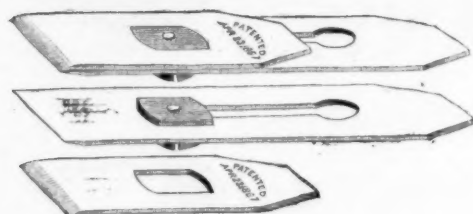
Referring to above card, we take pleasure in advising our former patrons and the trade in general, that we have made arrangements to sell and ship, in future, direct from factory, all goods of our manufacture. With location and shipping facilities unsurpassed, we can, at all times, guarantee to all points as low rates on freights as from either New York or Boston.

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developing an improvement in the manner of adjusting the cap so simple, and yet so convenient, as to instantly recommend itself to all mechanics who have an opportunity of testing it. The cap iron can always be removed and replaced without turning the screw, which, in other Double Plane Irons, holds the cap in place and has to be loosened with a screw-driver every time the cutter is sharpened. This patented improvement will be used exclusively in Planes of our manufacture.

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PATENT DOUBLE ACTING SPRING BUTTS,
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The **BOSS** and **CROWN** Door Springs,
For Screen and Light Inside Doors.

NATIONAL Horse Nail Co.

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The only hot forged machine made Horse Shoe Nail in the world that is not sheared or cut on the point. Warranted never to split or shiver in the driving, and to hold the shoe longer than any other Nail. For sale by the hardware and iron trade generally.
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Established in 1839.

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Manufacturers of L. Coes' PATENT SCREW WRENCHES

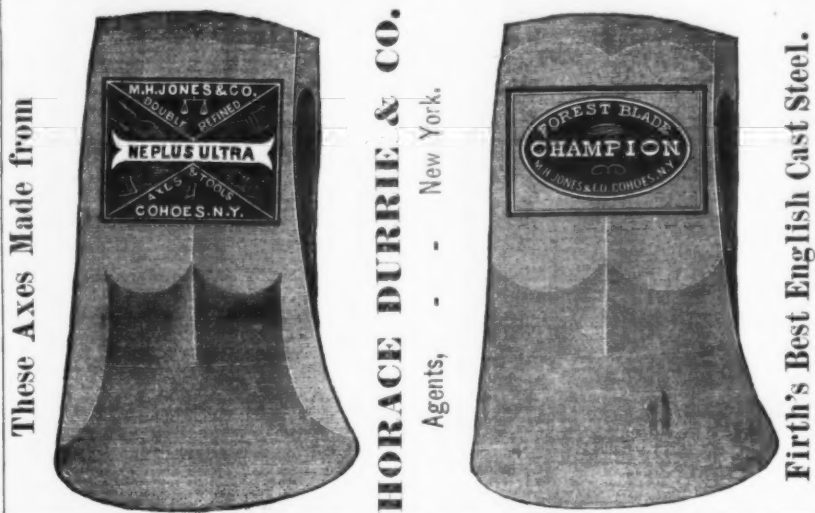
JUNE 26, 1866,
MARCH 23, 1869,
REISSUED 1870.

NOVEMBER 10, 1863,
FEBRUARY 23, 1864,
REISSUED JUNE 1, 1869,
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The back thrust when in use borne by the SHANK instead of the Handle.
None genuine unless stamped "L. COES & CO."

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HORACE DURRIE & CO.
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Firth's Best English Cast Steel.

The 1878 Pennsylvania Lawn Mower.

LIGHT DRAFT AND EASILY ADJUSTED.



This machine presents all the advantages of a light and durable **LAWN MOWER**, and we believe has good qualities which cannot fail to be appreciated. It is the lightest machine in use, and all that is necessary to satisfy our customers of its superiority is to place it in competition with any other machine in the town in which they may reside.
Every machine warranted to work as represented.

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Width of Cutter.	Description.	Price.
12 inch.	8 in. driving wheel, wt. 33 1/2 lbs. Can be used by a lady. each,	\$18.00
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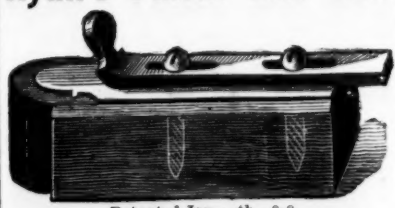
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With Flat, Round, Oval, Depressed, Screw and Fancy Heads.

Molding and Finishing Nails, with or without heads. **Brush Makers', Upholsterers', Cigar Box, Basket, Chair and Undertakers' Finishing Nails** a specialty. **Shoe Nails of Brass and Iron. Bright Iron Rivets, Brass and Iron Keatchoon Pins,** with flat, round and fancy heads, all sizes on hand and to order.

OFFICE AND WORKS: Nos. 63 & 65 Elizabeth Street, New York.

Hyatt's Patent Slot Bolt.



Patented Jan. 29th, 1878.
For Fastening Window Screens, Cabinet Ware, &c

We call the attention of the trade to these Wrought Brass Bolts as being the best and cheapest in the market. Sizes, two inches and upward, both plain and neck bolts. Two screws (as shown in the cut) fasten the bolt and bed-plate to the wood; no others are required, thus effecting a great saving in screws and producing a strong, handsome and cheap Bolt. Price list furnished on application.
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We also manufacture all kinds of Brass Goods, Plate Escutcheons, Drop Bases, Thumbies for Door Knobs, Brass Labels, Patent Mirror Business Cards, &c.

CARROLL L. RIKER, JOBBER OF SPECIALTIES, offers the following regular specialties to the trade in the quantities and at the prices quoted: Coes' Pattern Malleable Wrench, 10 in. 24c. ea.; 12 in. 30c. ea.; Giant Nail Puller, \$2.50 ea.; and Little Giant ditto, \$1.50 ea.; Dover Egg Beater, family or tumbler size, 35c. ea.; Mrs. Potts' Fat. Crown Irons, 5 pieces, \$1.25 perfect; the Crown Fluter, 4 1/2 in. rolls, \$2.50 ea.; Clawed Tack Hammer, 6c. ea.; the Lawrence Perfect Curry Comb, 5 bars, close back, 50c. ea.; 6 bars, open back, 80c. ea.; Romer & Co.'s Padlocks, No. 205, 1 in. high, 12c. ea.; Mouse Traps, 25c. per doz. holes; Heavy Adze Eye Malleable Hammer, full poll, 10c. ea.; Marvin's Saws, 20 1/2 off the list price; Marvin's Scales, 40 1/2 off the list price; Fairbanks Scales, 3 1/2 off the list; Seven-Chambered Revolver, warranted steel barrel and chamber, nickel-plated, 22 bore, with clean-up and box, \$1.20; Swift's Coffee Mills, discount 25 1/2 from list. Screws by the single gross, 6 1/2 off Russell & Erwin's list; Sand Paper, B. A. & Co.'s, fine, medium and coarse, 10c. per sheet; Crystal Spring Toilet Soap, dozen; the same, extra fine, 30c. ea. Terms, net cash before shipment; packing, 25c.; cartage, 25c. Send postage for my illustrated catalogue containing cuts of several hundred different specialties.
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Manufacturers of Waterman and Russell's
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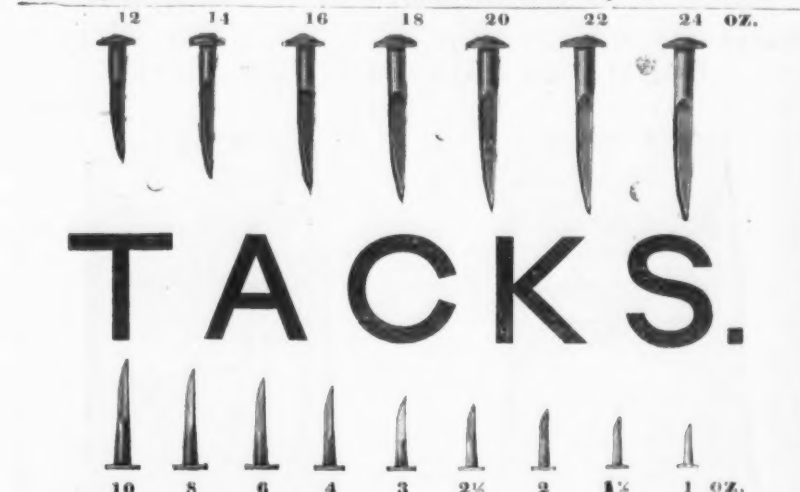


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Swedes Iron, Upholsterers', Gimp & Cut Tacks.

TINNED, LEATHERED AND LARGE HEAD IRON CARPET TACKS.

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Copper, Iron and Galvanized Boat Nails (Regular or Chisel Pointed), Brass and Iron

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Nails, 2d & 3d Pine Nails, Roofing Tacks and Nails, &c., &c.

Made by the **AMERICAN TACK CO.**, Fairhaven, Mass.

A full line of goods may be found at our

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Price, \$5.00.
In Morocco Case,
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MICROMETER CALIPER,
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Middletown, Conn.

This attractive and very desirable tool will be found more reliable and convenient than the Vernier Caliper, and to Machinists and Tool makers it is indispensable on work requiring very accurate and close measurement. Its capacity is one inch, and is graduated to one thousandths, but can readily be set one-half and quarter thousandths; and is so constructed that any wear resulting from use can be readily adjusted.

McNab & Harlin Mfg. Co., MANUFACTURERS OF BRASS COCKS AND VALVES For STEAM, WATER and GAS.

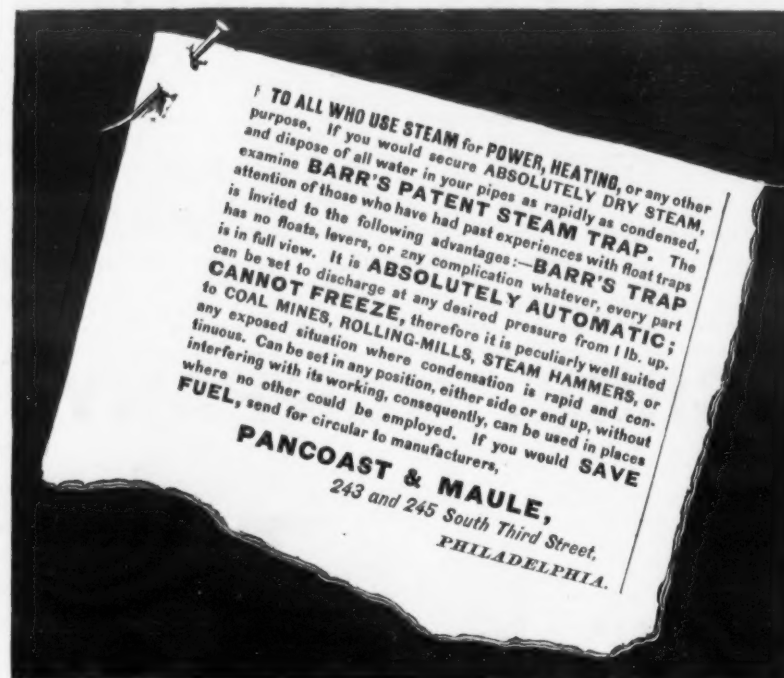
Iron Pipe and Fittings, Plain and Galvanized.

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New Illustrated Catalogue and Price List sent by express to the Trade on application.

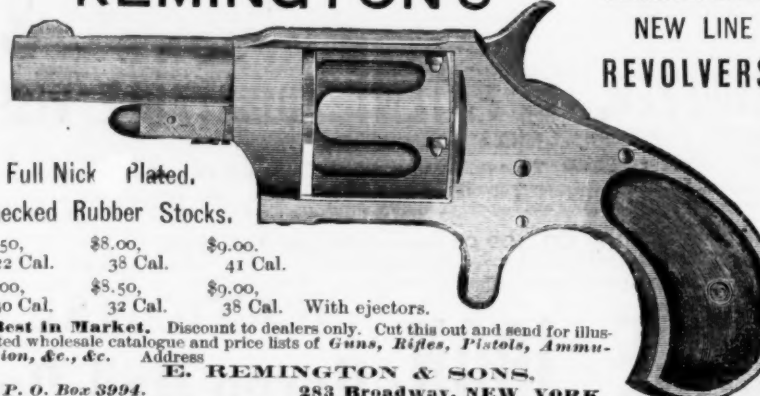
Factory, Paterson, N. J.

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NEW LINE
REVOLVERS.



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\$2.50, 22 Cal. \$8.00, 38 Cal. \$9.00, 41 Cal.

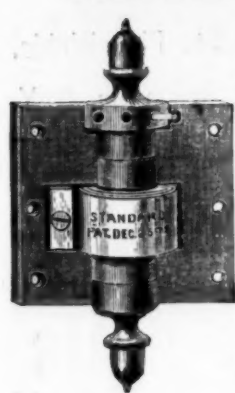
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Manufacturers of
**Standard Patent
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Single-Acting,

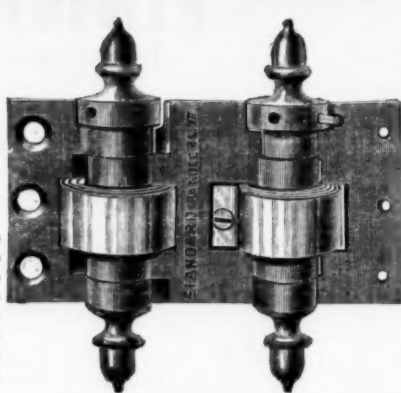
Per pair.
2x2.....\$.75
2 1/2 x 2 1/2.....1.00
3x3.....1.50
4x4.....2.00
5x5.....3.00
6x6.....4.00
Discount the Trade.



Manufacturers of
**Perfection
Step Ladder.**

PRICES.

3 feet.....\$2.50
4 ".....3.00
5 ".....3.50
6 ".....4.00
7 ".....4.50
8 ".....5.00
9 ".....5.50
10 ".....6.00
Discount to the Trade.



Manufacturers of
**Standard Patent
Spring Hinge.**

PRICES.

Double-Acting.
Per pair.
2 1/2 x 2 1/2.....\$2.00
3x3.....3.00
4x4.....4.00
5x5.....5.00
6x6.....6.00
7x7.....7.00
Discount to the Trade.

Manufacturers of Step Ladders

FACTORY: 448, 449, 450 and 451 West St.

s, Oil Can Screw Tops, Metal Rings, House Furnishing Goods, and Jobbers in General Hardware. Send for our price list.

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No. 34 Reade Street, New York,

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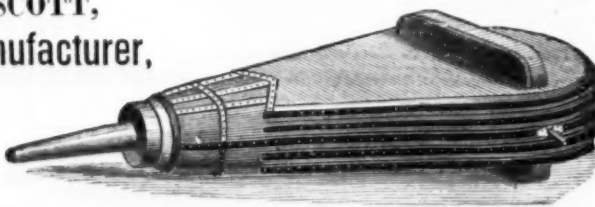
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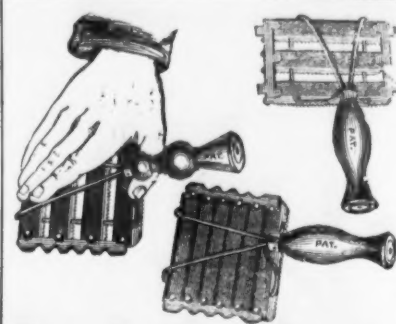
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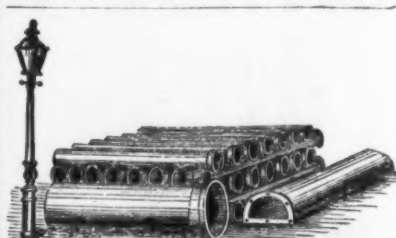
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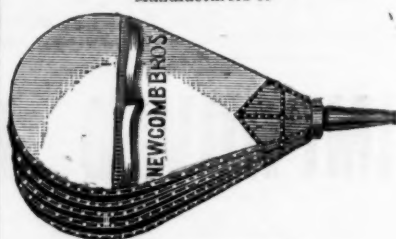
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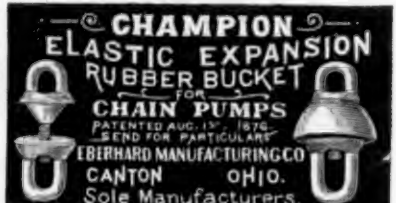


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Engines, Caloric. Brown Caloric Engine Co., 57 Lewis, N. Y. 1			
Engines (Locomotive). Baldwin Locomotive Works, Philadelphia, Pa. 4			
Engines, Steam, Makers of. Ervin Chas. V. & Co., Kensington, Phila. 38 Farquhar A. & Co., New York, N. Y. 39 Fitchburg Steam Engine Co., Fitchburg, Mass. 38 Lundis F. E. & A. B., Lancaster, Pa. 38 Payne E. W. & Co., Brooklyn, N. Y. 36 Payne E. W. & Co., Brooklyn, N. Y. 36			
Export Factors. Jennings S. H., Deep River, Conn. 20			
Faucets, Brass, Makers of. McNab & Co., Phila. Mfg. Co., 50 John, N. Y. 37			
Faucets, Wood. Penfield Block Works, Lockport, N. Y. 37			
Faucets, Self-Measuring, Makers of. Enterprise Mfg. Co., of Pa., Phila. and N. Y. 37			
Feltling. Crane & Chapin, 31 & 33 Courtlandt, N. Y. 19			
Files, Importers of. Carl J. & Riley, 82 John, N. Y. 31 McNab & Co., Phila. Mfg. Co., 50 John, N. Y. 37 Moss F. W., 30 John, N. Y. 37 Sanderson Bros. & Co., 16 Cliff, N. Y. 2			
Files, Manufacturers of. American File Works, 23 Buckner, R. I. 13 Auburn File Works, 43 Chambers, N. Y. 2 Barnett O. W., 41 and 43 Richmond, Phila. 8 Barnett O. W., 41 and 43 Richmond, Phila. 8 Diston Henry & Sons, Phila. 29 Draper C. T. & Co., Sing Sing, N. Y. 39 Eberhart James M., Seneca, N. Y. 40 Heller & Bros., Newark, N. J. 40 Johnson & Bros., 1 Commercial, Newark, N. J. 40 Nicholson File Co., Providence, R. I. 8 Paul Chas. B., Williamsburgh, N. Y. 8			
Fire Brick, Makers of. Borger & Co., Philadelphia, Pa. 37 Brooklyn Clay Retort and Fire Brick Works, Van Dyke St., Brooklyn, N. Y. 39 Garner Brothers, 29 Beade, N. Y. 20 Hall A. & Sons, Perth Amboy, N. J. 10 Hall & Sons, Buffalo, N. Y. 10 Maurer James B. & Sons, 45 Goerck, N. Y. 10 Kreischer B. & Sons, 50 Goerck, N. Y. 10 New York Co., Albany, N. Y. 10 Maurer James B. & Sons, 45 Goerck, N. Y. 10 Valentine M. D. & Bro., Woodbridge, N. J. 10 Watson John R., Perth Amboy, N. J. 10			
Flint and Emery Paper and Cloth. Beeder, Adamson & Co., 73 Market, Phila. 2			
Flower Pot Stands. Barnum E. T., Detroit, Mich. 43			
Fluting Irons. Burger & Bauninger, 28 Duane, N. Y. 31			
Forging Machines. Shepard Mfg. Co., Buffalo, N. Y. 37 The American Machine Co., Philadelphia 12 Weeks A. A., 32 John, N. Y. 6			
Forges, Portable. Keystone Portable Forge Co., Philadelphia, Pa. 37 Empire Portable Forge Co., Cohoes, N. Y. 26			
Foundries. Brown J. J., Rockwood, Tenn. 37			
Foundry Facings. Paxson J. W. & Co., 514 Beach, Phila. 5 Whitehead Bros., 517 W. 15th, N. Y. 5			
Friction Clutch. Smith James & Co., 137 Market, Philadelphia 36			
Furnaces, Makers of. Richmond & Potts, 119 S. Fourth, Phila. 5			
Furniture Springs. Carey & Moen, 234 W. 27th, N. Y. 3 Haigh Lloyd J., 30 John, N. Y. 3			
Galvanized Iron. Lefferts Marshall, Jr., 90 Beekman, N. Y. 4			
Grindstones. Smith & Hughes Stone Co., Cleveland, O. 33 Wood H. S. & Co., 38 West, N. Y. 3 Wood Walter R., 233 and 235 Front, N. Y. 3 Wood Walter R. & Sons, North Amherst, O. 33			
Guns, &c. Windmiller Louis & Roelker, 20 Beade, N. Y. 20			
Gunpowder, Makers of. Knoblock F. L. (DuPont) 70 Wall, N. Y. 32 Latta & Rany, 70 Wall, N. Y. 32			
Hardware Commission Merchants. Graham & Haines, 113 Chambers, N. Y. 16 Mason Mfg. Co., 116 Chambers, N. Y. 16 Enterprise Mfg. Co., Phila. 37 Tennis & Wilson, 81 Beekman, N. Y. 31 Walbridge G. B. & Co., 83 Beade, N. Y. 31			
Hardware Dealers. Baker Hermann & Co., 101 Duane, N. Y. 33 Coy & Co., 134 and 136 Duane, N. Y. 33 Windmiller Louis & Roelker, 20 Beade, N. Y. 20			
Hardware Manufacturers. American Spiral Spring Butt Co., 32 Beekman, N. Y. 40 Clark & Co., Buffalo, N. Y. 37 Coulter, Flagler & Co., 37 Chambers, N. Y. 37 Cowles Hardware Co., Unionville, Conn. 31 Enterprise Mfg. Co., Phila. 37 Lloyd, Supple & Walton, 625 Market St., Phila. 34 Malloy, Charles C., 34 Beade, N. Y. 32 Mason Mfg. Co., 116 Chambers, N. Y. 16 Bliss Mfg. Co., Pawtucket, R. I. 32 Russell & Erwin Mfg. Co., New York 32 Shepard Hardware Co., Buffalo, N. Y. 37 Stanley Works, New Britain, Conn. 12 Union Mfg. Co., 92 Chambers, N. Y. 40 Van Wagner & Williams, 25 Beekman, N. Y. 40			
Hardware Specialties. Mason Mfg. Co., 116 Chambers, N. Y. 16 Shepard Sidney & Co., Buffalo, N. Y. 31 Spencer & Underhill, 24 Chambers, N. Y. 36			
Hardware (Wagon). Covert E. & J. C., Farmer Village, N. Y. 36			
Harness Snaps. Covert Mfg. Co., Troy, N. Y. 13			
Hay Knives. Holt Hiram & Co., East Wilton, Me. 6			
Hinges. Lewis, Oliver & Phillips, Pittsburgh, Pa. 12 Stanley Works, New Britain, Conn. 12			
Hog Ringers. Chambers, Bering & Quinlan, Decatur, Ill. 32			
Holding Engines, Makers of. Enterprise Mfg. Co., Chicago, Ill. 37 Mundy J. S., Newark, N. J. 37			
Holding Machines. Harrington Edwin & Son, Philadelphia, Pa. 28 Mason Volney W. & Co., Providence, R. I. 40			
Hooks (Cotton & Bale). New York Handle & Mallet Works, 45 E. Houston 34			
Horse Nails, Makers of. Anvil Nail Co., Washington, N. Y. 12 Ausable Horse Nail Co., 4 Warren, N. Y. 12 Champion Steel Horse Nail Co., Appleton, Wis. 33 Hobe Nail Co., Boston, Mass. 37 EP Horse Nail Co., Cleveland, O. 37 Northwestern Horse Nail Co., Chicago, Ill. 37 Putnam Nail Co., Neponset, Mass. 37 Stetson N. Jr., 73 Pearl, N. Y. 33			
Horse Shoes, Makers of. Boston Rolling Mills, 17 Battery March, Boston 4 Burden Iron Works, Troy, N. Y. 4 Rhode Island Horse Shoe Co., Providence, R. I. 9 Schoenberger & Co., Pittsburgh, Pa. 4			
Hydrants, &c. McLean John, 30 Monroe, N. Y. 35			
Hydraulic Jacks. Dudson Richard, 24 Columbia, N. Y. 37			
Insurance, Boiler. Hartford Steam Boiler Inspection & Insurance Co. 39			
Iron Brokers. Boynton Geo. A., 70 Wall, N. Y. 5 Eding Edward J., Philadelphia, Pa. 5 Hart A. G., 101 Duane, N. Y. 33 Hazard T. D., 204 Pearl, N. Y. 4			
Iron, Charcoal, Warm or Cold Blast. Quincy John W. & William, N. Y. 37			
Iron Commission Merchants. Adams Hugh W., 50 Pine, N. Y. 37			
Iron, Pig, Importers of. Low S. R., Chattanooga, Tenn. 37 Sponser & Collins, St. Louis, Mo. 37			
Iron, Pig, Manufacturers of. Williams James & Co., 60 Wall, N. Y. 4			
Iron Dealers. Abeel Brothers, 105 South, N. Y. 4 Barnett O. W., 41 and 43 Richmond, Phila. 8 Borden & Lovell, 70 and 72 West, N. Y. 3 Carmichael W. J., 135 and 137 Cedar, N. Y. 4 The Latham & Gooding Co., 18 Chambers, N. Y. 4 Harsiel G. O., Market Slip, N. Y. 4 Harrison & Gillson, 95 West 10th, N. Y. 4 H. H. Jackson, 105 and 107 Franklin, N. Y. 4 Judson B. F., 47 and 49 Water, N. Y. 4 Kane C., Pittsburgh, Pa. 4 Knoblock F. L. (DuPont) 70 Wall, N. Y. 32 Ogden & Wallace, 85, 87, 89 and 91 Elm, N. Y. 4 Person & Co., 24 Broadway, N. Y. 4 Putnam J. H., 101 Duane, N. Y. 33 Quincy John W. & William, N. Y. 37 Richards D. W. & Co., 50 Mangin, N. Y. 4 Wallace Wm. H. & Co., Albany and Washington streets, N. Y. 4 Warner A. B. & Sons, 26 and 28 West, N. Y. 4 Whitman J. H. & Co., Philadelphia, Pa. 4 Whitney A. B. & Bro., 105 Wall, N. Y. 4			
Iron, (Manufacturers Agents). Boston Manufacturing Co., Philadelphia, Pa. 4 Iron, Manufacturers of. Boston Rolling Mills, 17 Battery March, Boston 4 Bradley, Boie & Co., 25 Chambers, N. Y. 4 Burden Iron Works, Troy, N. Y. 4 Collins H. E. & Co., Pittsburgh, Pa. 4 Fondley & Co., 101 Duane, N. Y. 33 Kirkpatrick, Beale & Co., Pittsburgh, Pa. 4 Leonard John, 40 and 42 West, N. Y. 4 Oxford Iron Co., 80 Walnut, Philadelphia 4 Phonix Iron Co., Chattanooga, Tenn. 4 Reynolds James Co., 520 Delaware, Phila. 4 Rowland Wm. & Harvey, Philadelphia 4 Shoenberger & Co., Pittsburgh, Pa. 4 Taylor & Boggs, Cleveland, O. 4 The Pacific Rolling Mills, 17 Battery March, Boston 4 Vulcan Iron and Nail Works, Chattanooga, Tenn. 4 Vulcan Iron and Nail Works,			

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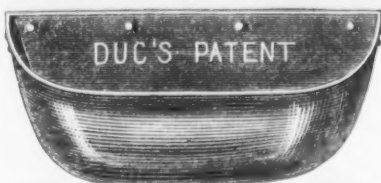


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Are made considerably lighter, but in every other respect like the ordinary hand-saw file; the lengths range from 4 to 12 inches (by inches only),—being made from the sizes of three-square sections stated below.

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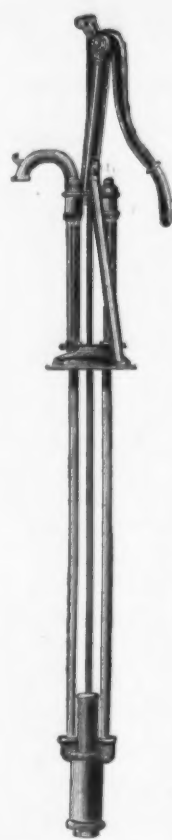
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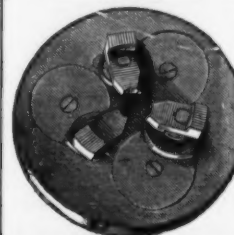
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5	3,000	40 00	1 75
6	4,000	50 00	2 00
8	6,000	75 00	3 00
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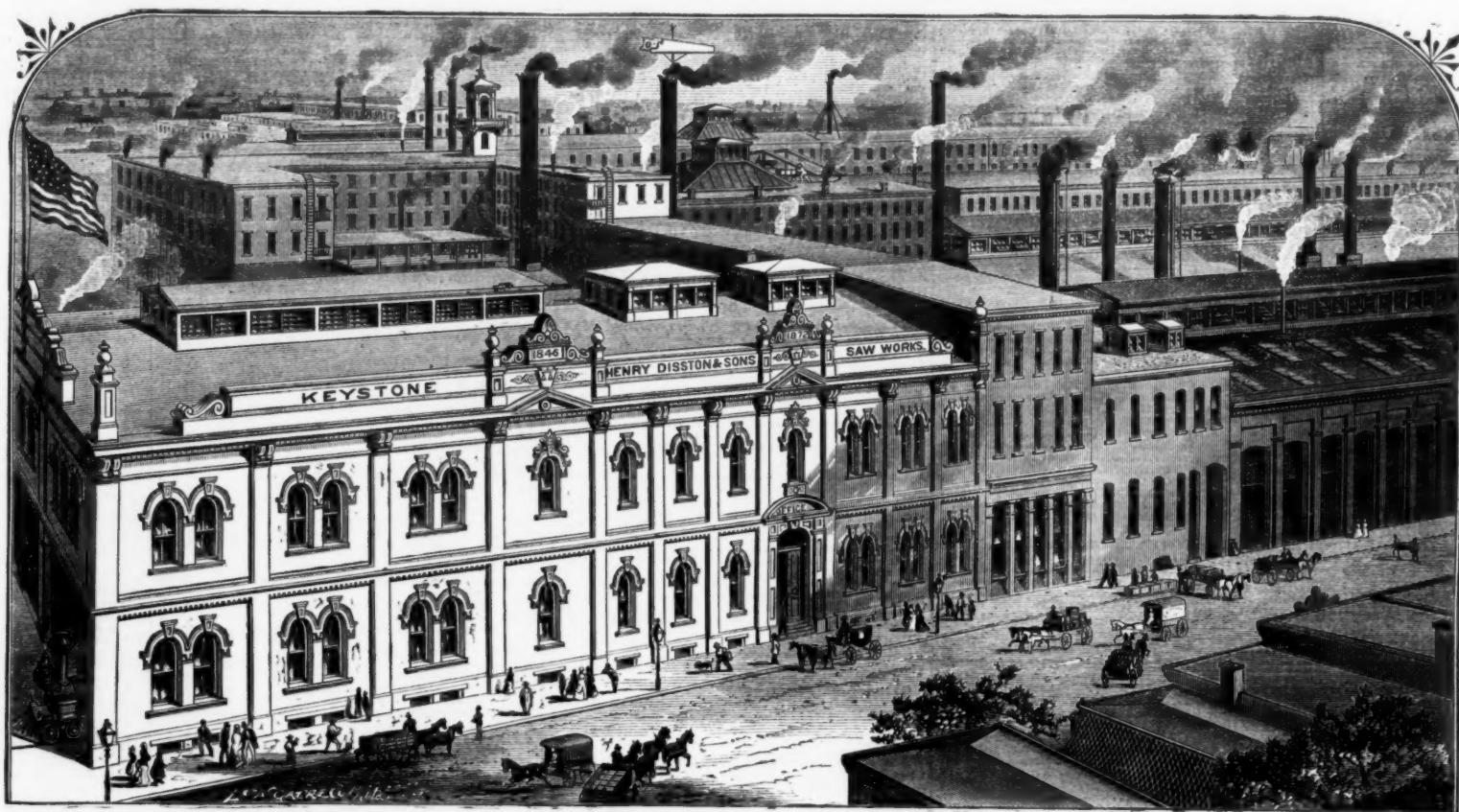


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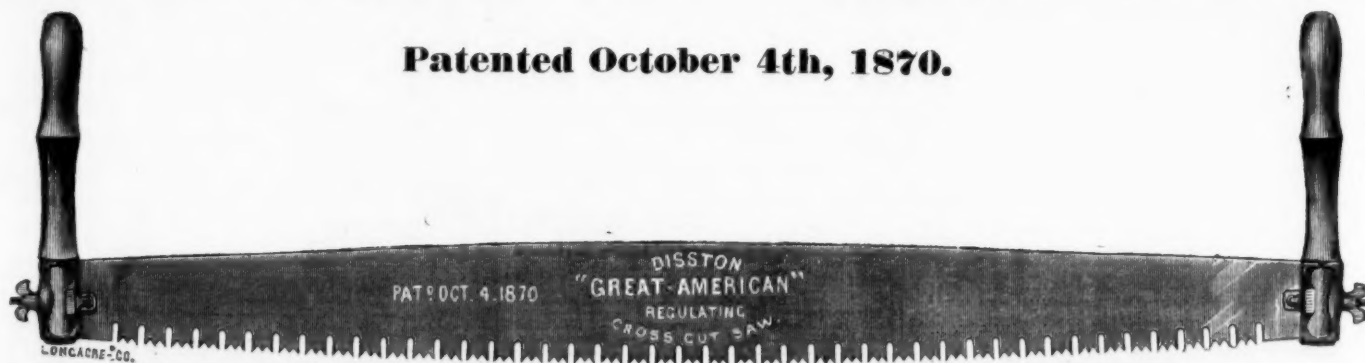
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Particular care is taken in the manufacture of these Saws. They are made of the finest quality of steel, of uniform and high temper, ground gradually tapering from the teeth to the back, and are set and sharpened in the most perfect manner. Each Saw is highly finished and nicely etched, and guaranteed in every respect. The demand for this Saw has been and is constantly increasing, the number sold in the last year reaching over fourteen thousand.

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This saw is manufactured under the same patent, and is as highly finished and fully warranted as the regular Great American Cross-cut Saw, but is ground on the same principle as our extra quality hand saws.

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" Damar.....	250
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6 X 8 to 10 X 12.....	\$ 2.50	\$ 6.75	\$ 6.25	\$ 5.75
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13 X 22 to 20 X 30.....	10.75	6.75	6.75	7.75
15 X 26 to 24 X 30.....	12.25	10.75	6.00	
20 X 28 to 24 X 30.....	13.00	11.50	6.75	
20 X 37 to 20 X 44.....	14.50	13.25	10.75	
20 X 40 to 30 X 50.....	15.00	14.00	11.25	
20 X 42 to 30 X 54.....	16.50	14.50	12.00	
30 X 50 to 34 X 59.....	17.25	15.50	13.50	
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36 X 50 to 42 X 60.....	20.75	18.75	17.25	

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13 X 22 to 20 X 30.....	17.25	15.75	14.50	
15 X 26 to 24 X 30.....	19.75	17.25	14.50	
20 X 28 to 24 X 30.....	21.00	18.50	14.75	
20 X 30 to 20 X 44.....	23.25	21.25	17.25	
20 X 40 to 30 X 50.....	24.00	23.50	18.00	
30 X 50 to 34 X 59.....	26.75	25.00	21.75	
34 X 50 to 34 X 60.....	28.75	27.75	24.00	
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Sizes above 40 x 60—\$10.00 per box extra for every five inches.

An additional 10 per cent. will be charged for a glass more than 40 inches wide. All sizes above 40 inches in length, and not making more than 8 unite inches, will be charged in the 8 unite inches bra.

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PLATE (SHEARS,

No. 5 will cut 7-16 Iron
through center of sheet.

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"Double Rim."

oblong, Nineteen Sizes.

with a very handsome O. G. edge, and lined with
is the same as heretofore, but improved in finish
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With Brass or Nickel Flutes. Prices furnished upon
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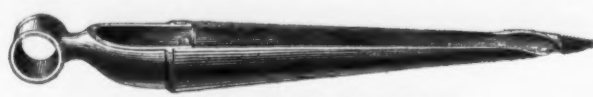
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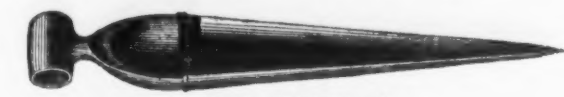
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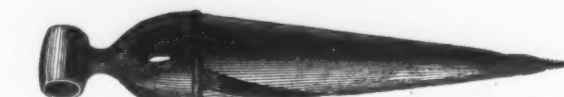
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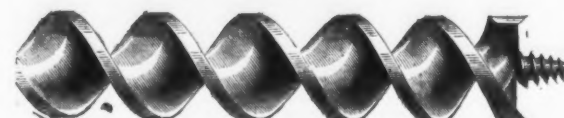
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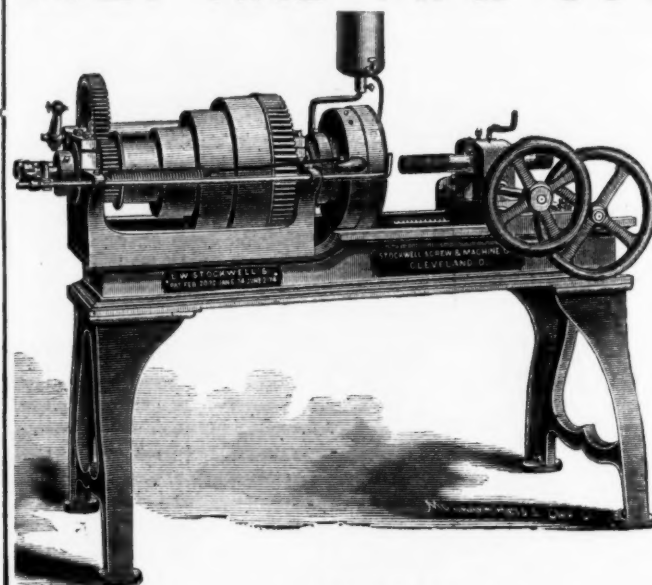
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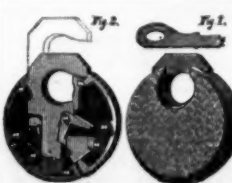
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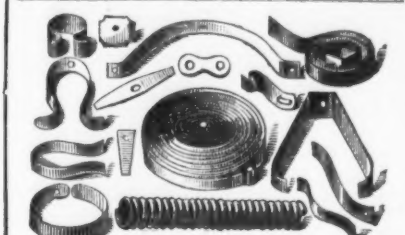
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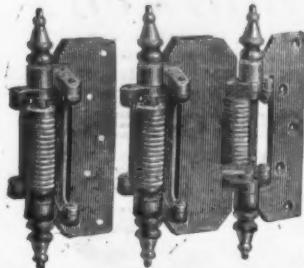
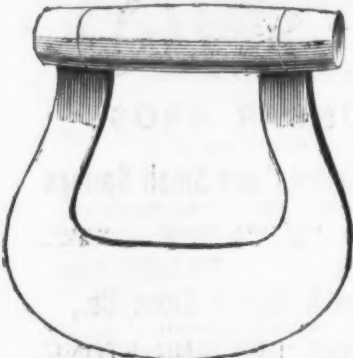
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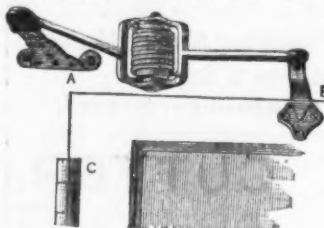
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On an entirely new principle, distinct from all others.
Holds the door open as well as shut, and allows the door
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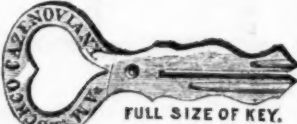
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THEY HAVE

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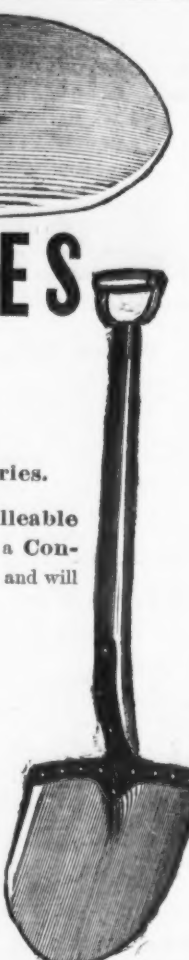
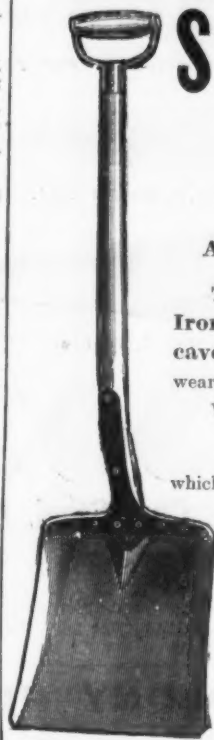
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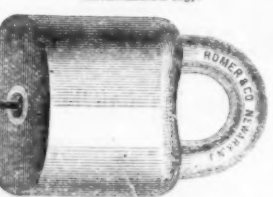
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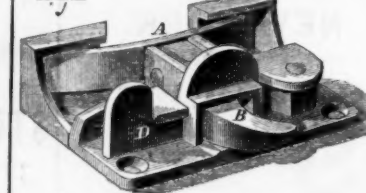
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Will securely hold any article, from a silk handkerchief to a
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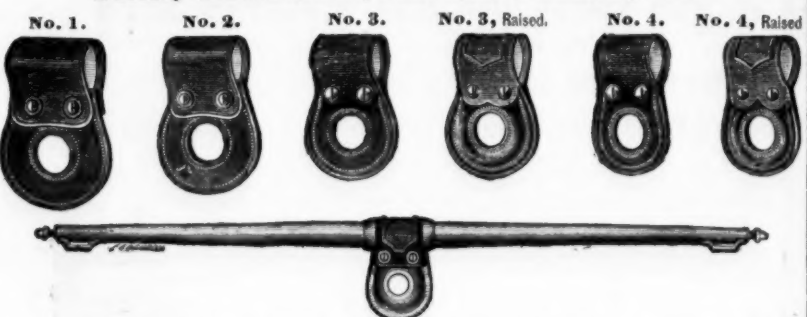
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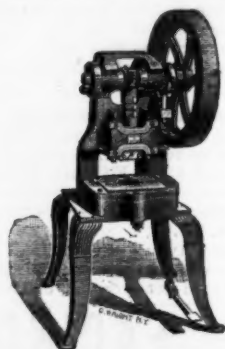
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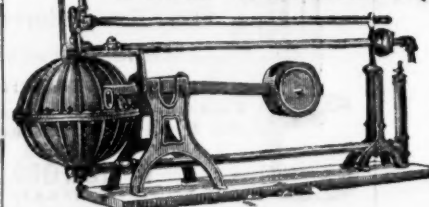
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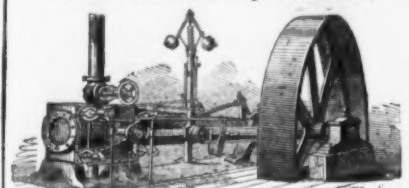


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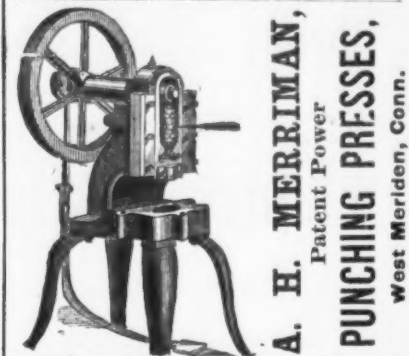
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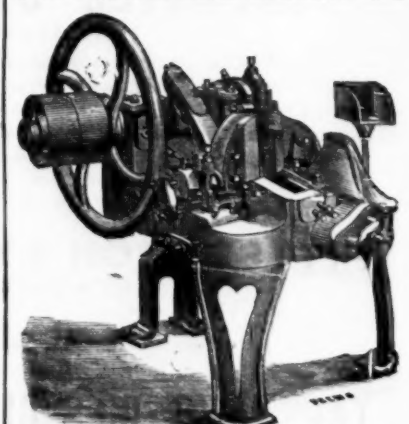
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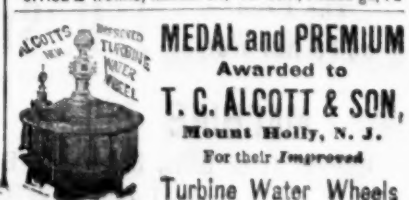
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RE-ROLLED NORWAY SHAPES.
NORWAY NAIL RODS ROLLED AND SLIT FROM SUPERIOR BRANDS.

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This celebrated Mincing Knife has been in the market for the past ten years. It is made from the best Cast Steel, and will cut twice as fast as the ordinary knife, and will not choke up in use like the old style of Two-Bladed Knives.

It is drawn over the wire
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The thin blades are held at
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The knives can be taken out and sharpened and replaced by use of the set-screw which passes through the handle.

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Light and heavy Steel Castings of superior metal, solid and homogeneous. All work guaranteed. Send for circular.

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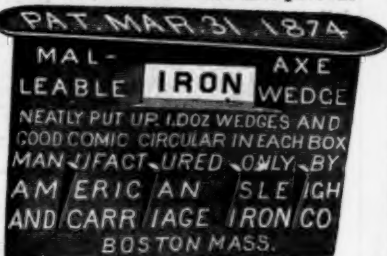
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Heads Polished and Lacquered.



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From New Patterns.

NEW IMPROVEMENTS

STRONG AND POWERFUL.

Cost One-third Less than

any Drill in the Market.

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FRICTION CLUTCHES.
For connecting Shafts and Gearing.
Hoisting Machinery & Elevators, Shafting,
Hangers and Gearing.
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See cut of Elevator Hoisting Machine in issue of
Sept. 15, 1878, page 38.

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Will cut faster, wear longer, and clog
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Carriage Bolts made from Best Square Iron a Specialty.

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FIRST HOME MANUFACTURERS.

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Manufacturer of all kinds of

First-Class Saws, Saw Frames, Cross-Cut Handles, Tools, Files, &c. Also Sole Proprietor and Manufacturer of the Genuine Patent Lightning Saw.

80 BECKMAN STREET, NEW YORK.

TRIAL OF THE IMPROVED LIGHTNING SAW.

The Emperor Dom Pedro, accompanied by Director General Goshorn, Superintendent Albert, and others, visited Machinery Hall, at the Centennial on the evening of June 28th. Among other things inspected, at the invitation of E. M. BOYNTON, of New York, they witnessed a trial of the *New Lightning Saw*, patented March 26, 1876. Two men, with one of these saws, cut off a sound log of gum-wood, one foot extreme diameter, in seven seconds, or at the rate of a cord of wood in five minutes. Messrs. Corliss, Morell, Lynch, and other members of the commission witnessed the trial and timed the cutting. The Emperor remarked, That was fast, very fast cutting. Last evening the Emperor made another examination of the saw.—*Philadelphia Press*, June 30.

"BOYNTON'S SAWS were effectually tested before the judges at the Philadelphia Fair, July 6th and 7th. An ash log, eleven inches in diameter, was sawed off, with a four-and-a-half-foot lightning cross-cut, by two men, in precisely six seconds as timed by the chairman of the Centennial Judges of Class Fifteen. The speed is unprecedented, and would cut a cord of wood in four minutes. The representatives of Russia, Austria, France, Italy, Spain, Belgium, Sweden, England, and several other countries, were present, and expressed their high appreciation."

Received Medal and Highest Award of Centennial World's Fair, 1876.

\$1000 Challenge was prominently displayed for six months, and the numerous saw manufacturers of the world dared not accept it, or test in a competition so hopeless.

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Manufacturers of and Dealers in all kinds of

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Also, MOULDING AND FIRE SAND.



These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, case-hardened throughout, and not only combine all of the superior qualities of our Cylinder or Gas Pipe Wrenches, but also all requisite combinations of a regular Nut Wrench, thus making a combination which has no equal.

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Am. Spiral Spring Butts

WARRANTED TO BE THE

Most Powerful and Most Durable Spring Hinges in the Market.



The same Butts can be used for either right or left hand doors. Send for reduced price list March 1, 1877.

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